

NEW 1937 UNIVERSAL COOLER



COMMERCIAL REFRIGERATION EQUIPMENT COMPLETE STANDARD LINE - OR - DESIGNED FOR YOUR SPECIFIC NEEDS

Featurefull

Universal Cooler condensing units form a complete line of equipment for refrigeration requirements from $\frac{1}{8}$ to 15 H.P.

The 1937 line of condensing units pictured on this page embody high standards of manufacture with even greater efficiency than ever and lower cost of operation. The line is complete and all units are uniform in design, appearance, performance, efficiency and economy.

Flexibility—Three speeds for each model for: (1) Low Temperature Work, (2) Equipment operating on a defrosting cycle and (3) Air Conditioning.

Valve-in-Head—The enviable performance of the valve-in-head principle, particularly with regard to correct lubrication is now available to users of all sizes of Universal Cooler units from $\frac{1}{8}$ to 15 H.P.

Oil Separation—Special provisions for keeping the oil in the crankcase and out of the path of the refrigerant are incorporated in all Universal Cooler units . . . scientific lubrication of every part without oil logging.

Large Receivers—Full pumped-down-capacity is provided in the large sized receivers which are standard throughout the line.

Slow Speed—These units operate at slow speeds . . . 11 compressors give full coverage from $\frac{1}{8}$ HP to 15 HP . . . a different block for practically each horsepower thus assuring maximum performance and efficiency for every model.

Freon or Methyl Chloride—Units are designed for efficient low cost operation using Freon-12 or Methyl Chloride as refrigerants.

Metal Gaskets—Metal head gaskets scientifically applied entirely eliminate leakage and prevent seepage of either oil or refrigerant.

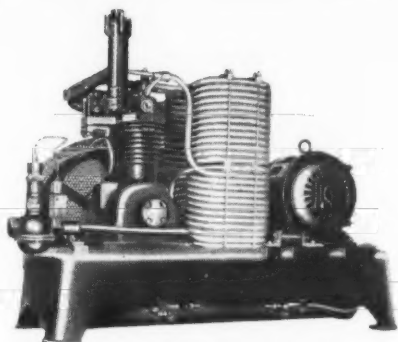
Sturdy Cast Iron Bases—Specially designed bases minimize sound, stop drumming and always maintain perfect alignment of pulleys, thereby lengthening the life of the belts.

Oversize V-Belt-Drives—Scientifically designed drive utilizing oversize V belts indicates years of trouble-free use.

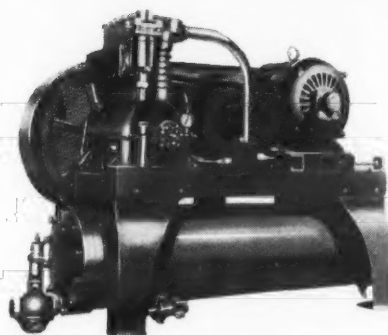
Air Cooled Condensers—Condensers on air cooled units are large and of the radiator type with forced air circulation. They assure full capacity even in the hottest weather.

Water Cooled Condensers—Special double copper tube condensers are provided on all water cooled units up to 10 HP. The large surface of this special type counter flow condenser increases performance . . . reduces operating cost. The 15 ton unit has a large shell and copper tube condenser.

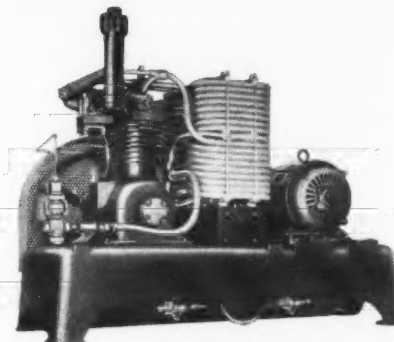
Special for Air Conditioning—Units particularly adapted to Air Conditioning are available in 1, $1\frac{1}{2}$, 2, 3, 5, $7\frac{1}{2}$, 10 and 15 HP. These condensing units are compact, quiet, and free from vibration. The fusible plug in the receiver provides for an outside connection as specified in Codes. Universal Cooler condensing units meet all the requirements for high efficiency, dependability, compactness and low cost of operation in the Air Conditioning field.



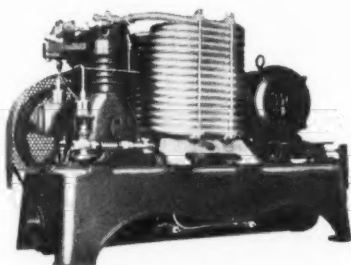
MODEL W 1000
10 H. P. Water Cooled



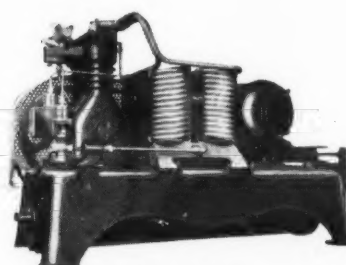
MODEL W 1500
15 H. P. Water Cooled



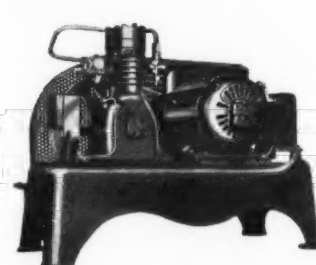
MODEL W 750
7½ H. P. Water Cooled



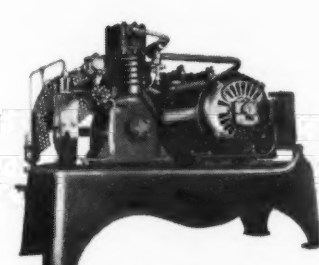
MODEL W 500
5 H. P. Water Cooled



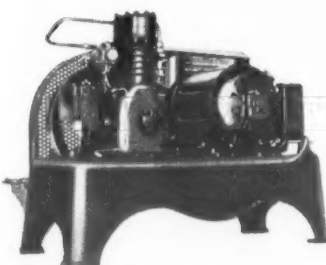
MODEL W 300
3 H. P. Water Cooled



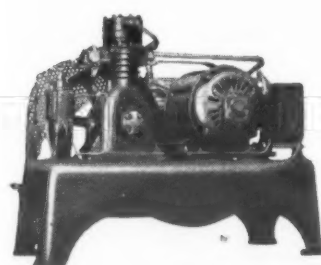
MODEL 200
2 H. P. Air Cooled



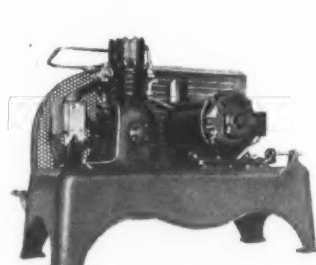
MODEL W 200
2 H. P. Water Cooled



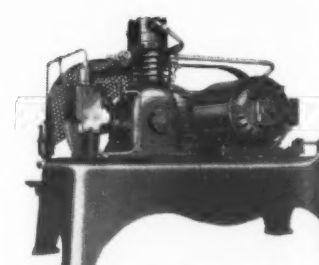
MODEL 150
1½ H. P. Air Cooled



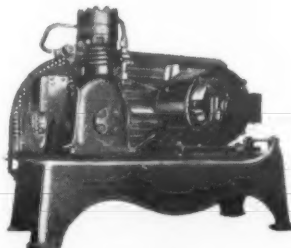
MODEL W 150
1½ H. P. Water Cooled



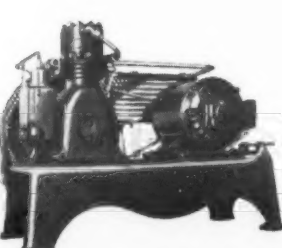
MODEL 100
1 H. P. Air Cooled



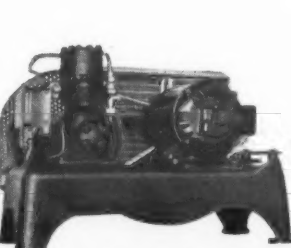
MODEL W 100
1 H. P. Water Cooled



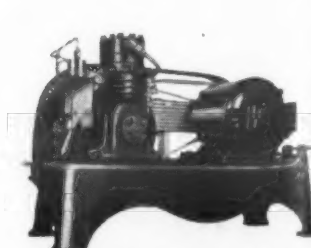
MODEL 75
¾ H. P. Air Cooled



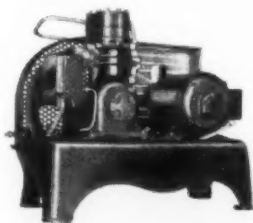
MODEL W 75
¾ H. P. Water Cooled



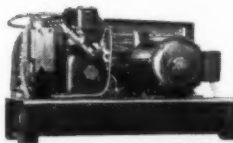
MODEL 50
½ H. P. Air Cooled



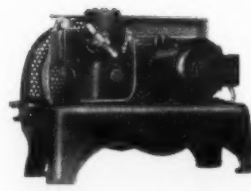
MODEL W 50
½ H. P. Water Cooled



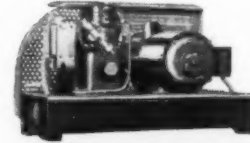
MODEL 33
½ H. P. Air Cooled



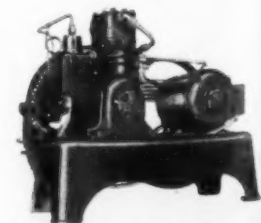
MODEL 25 LIGHT
¼ H. P. Air Cooled



MODEL 25
¼ H. P. Air Cooled



MODEL 33 LIGHT
½ H. P. Air Cooled



MODEL W 33
½ H. P. Water Cooled

Universal Cooler commercial units have been inspected and passed by the Underwriters Laboratories. Capacities are certified to the Refrigeration Machinery Association and the National Electrical Manufacturers Association under the American Society of Refrigerating Engineers standard.



UNIVERSAL COOLER

DETROIT, MICHIGAN

or in Canada, Universal Cooler Co. of Canada, Ltd., Brantford, Ontario.

Inquiries are invited from manufacturers of Air Conditioning equipment, Beer, beverage and water cooling equipment, Ice cream freezers, Ice cream cabinets, Dairy equipment, Air washers, Dehumidifiers, Florist refrigerators, Refrigerated truck bodies, Soda fountains, Meat display cases, etc.

REFRIGERATION NEWS

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matter Aug. 1, 1927

DETROIT, MICHIGAN, MARCH 10, 1937

FOUR DOLLARS PER YEAR
TWENTY CENTS PER COPYOil Burner Show
Will Hear Four
Industry MenCarrier, Hertzler, Knighton
And Harrington on 5
Day Program

PHILADELPHIA — Program for the fourteenth National Oil Burner Show, to be held in the Commercial Museum here March 15 to 19, will include addresses by four persons prominent in the air-conditioning industry, and by a college professor whose researches into the health aspects of air conditioning have received considerable attention.

Speakers from the air-conditioning field are J. R. Hertzler, sales manager of the air-conditioning division of York Ice Machinery Corp.; Willis H. Carrier, chairman of the board of Carrier Corp.; Elliott Harrington of the air-conditioning department of General Electric Co.; and J. K. Knighton, sales manager of the air-conditioning department of Kelvinator division, Nash-Kelvinator Corp.

Others whose names are widely known in the appliance and conditioning industries include W. J. Donald, managing director of National Electrical Manufacturers Association, and Dr. C. A. Mills, professor of experimental medicine at the University of Cincinnati.

Complete program for the five-day meeting, most sessions of which will be held in Benjamin Franklin hotel, is as follows:

Monday, March 15—First air-conditioning lecture—J. R. Hertzler, sales manager, air-conditioning division, York Ice Machinery Corp.

Tuesday, March 16—(Engineering and technical sessions): Fuel Oil Specifications—Dr. R. T. Goodwin, manager, fuel oil department, Shell Union Oil Co.; Technical Aspects of Air Conditioning—Willis H. Carrier, (Concluded on Page 13, Column 4)

Conditioning of 800
Cars Planned by
20 Railroads

WASHINGTON, D. C.—Air conditioning of 800 additional railway passenger cars by 20 different railroads as merely the "start" of a vastly accelerated nation-wide program of railroad air conditioning for 1937 was reported last week by William B. Henderson, executive vice president of the Air-Conditioning Manufacturers Association.

This is the beginning of the 1937 extension of the railroad air-conditioning program which saw 2,000 passenger coaches conditioned during 1936, bringing the total of such installations to more than 8,000 by the end of that year, according to Henderson's figures.

"By summer, almost all passenger trains, even the old locals and 'plugs,' will be air conditioned," declares the Kansas City Journal from its ringside seat at the railroad's great comeback fight.

(Concluded on Page 13, Column 1)

Sioux Steel Co. Named
Ortho-Clime Outlet

SIOUX FALLS, S. D.—Appointment of the Sioux Steel Co. to distribute Ortho-Clime air-conditioning equipment in this territory was made recently by Fairbanks, Morse & Co.

The Sioux Steel Co. was recently host to its dealers and salesmen at a four-day meeting in the ballroom of the Cataract hotel. Approximately 100 persons attended the meeting.

F. F. Stevenson of Fairbanks, Morse & Co. described the company's new air-conditioning line and plans at the dealer meeting. He was assisted by M. G. Swanson and C. A. Madole.

Peerless to Make
G-E Commercial
Cooling Units

CHICAGO — Peerless of America, Inc. (formerly Peerless Ice Machine Co. here) will manufacture the new General Electric "spinner" type finned cooling units for commercial refrigerating purposes in 1937, it was announced last week by H. T. Hulett, assistant commercial manager, and W. M. Timmerman, manager of the commercial engineering division of General Electric's refrigeration department.

Peerless will supply the complete line of G-E finned cooling coils with the exception of forced-draft units, and air-conditioning low sides.

In announcing the new source of supply for G-E's commercial evaporators, Mr. Hulett said that the following advantages were expected:

(1) Distributors and dealers will no longer have to tie up an investment in large stocks of odd size coils, nor provide extra warehousing facilities.

(2) It will be possible for dealers to fill orders for finned cooling units much more promptly than before.

(3) All coils are "tailor-made" according to rigid specifications set up by General Electric.

G-E's 1937 commercial evaporators will be featured by the new "spin-

(Concluded on Page 6, Column 3)

ACMA January Sales
Up 215% over '36

WASHINGTON, D. C.—Installed cost of equipment sold by the members of the Air Conditioning Manufacturers' Association in January totaled \$7,152,000, compared to \$2,271,000 in January, 1936, William B. Henderson, executive vice president, reported last week.

"This increase of almost 215% is due partly to early buying to escape the oversold condition of the industry such as was experienced last summer, and partly to the largest advertising and promotion program in the history of the Association," Mr. Henderson announced.

Richard Roper Heads
Pleasantaire Corp.

NEW YORK CITY—Richard F. Roper, 29-year-old son of Daniel F. Roper, Secretary of Commerce, has become president of Pleasantaire Corp., maker of Northwind summer air conditioners.

Trailers purchased from the Democratic party following their use in the last campaign will be used by Pleasantaire Corp. for sales demonstrations.

Heating, Ventilating Show
Next Jan. 24-28 in N. Y.

NEW YORK CITY—Fifth International Heating & Ventilating Exposition has been scheduled for Grand Central Palace here Jan. 24-28, 1938, under the supervision of International Exposition Co.

Westinghouse 'Quota Bustin' Salesmen
Tell How They Corralled Prospects

The following "How I Did It" stories from leading Westinghouse salesmen and dealers were gathered by News staff writers during the annual Westinghouse "Quota Buster" convention last week in Mansfield, Ohio, and Springfield, Mass.

Pushing the complete line of Westinghouse appliances, including the all-electric kitchen, has enabled D. M. Rogers, co-owner of Good House-keeping Shop in Vancouver, Wash., to net more than \$7,000 profit during his first full year in business.

Sales by the company during 1936 included 110 refrigerators, 89 electric ranges, 28 water heaters, and 93 pieces of laundry equipment, of which

Household
Refrigerator
Specifications

Next week's issue of the NEWS (March 17) will be the Annual Household Refrigerator Specifications Number.

The detailed data on all 1937 models of approximately 30 different makes will be published in pamphlet form, as a separate section, size 8½ x 11 inches, so that it may be conveniently inserted in a three-ring binder or a salesman's portfolio. The Specifications Section alone will contain 32 or more pages.

All of the data on 15 Nema makes, contained in the 16-page pamphlet recently issued by the Refrigeration Division of National Electrical Manufacturers Association, will be included in the Specifications Section of the NEWS, together with similar data on the models of about 15 additional companies which are not members of the Association.

Single copies of the Specifications Number will be available at 20¢ each; lots of 10 or more, 15¢ each; lots of 50 or more, 10¢ each. Remittance must be enclosed with order. Those desiring quantities are advised to wire reservations immediately.

Note: The second-class mail regulations affecting an issue published in two sections do not permit the mailing of one section only at the second-class mail rates. Therefore, it will not be possible to offer a further reduction in the price for quantity orders of the Specifications Section only.

Philadelphia Association
Cuts Out Spring Show

PHILADELPHIA — Electrical Association of Philadelphia is discontinuing its annual spring showing of electric refrigeration this year, reports George R. Conover, managing director.

The association has sponsored the spring shows in cooperation with distributors and dealers for the past seven years, Mr. Conover said. During the past couple of years, however, it was found that the shows had the tendency to slow up early spring business, prospects preferring to "wait until after the show" before buying.

So, instead of the spring show, the Electrical Association will sponsor a series of newspaper advertisements advising prospects to inspect new refrigerator models at dealers' stores.

New Firm Distributes
Kelvinator in Buffalo

BUFFALO — Appliance Wholesalers, Inc., a new corporation organized and headed by W. E. Henning, has taken over the local branch of Kelvinator Division, Nash-Kelvinator Corp., and will distribute Kelvinator products over the surrounding eight counties in New York, and five counties in Pennsylvania.

All retail operations of the former

(Concluded on Page 2, Column 4)

Stewart-Warner &
Leonard Raise
Prices

DETROIT—Increases in the retail prices of Leonard and Stewart-Warner electric refrigerators have been made during the past week, according to information from local distributors.

Although it is understood the new prices are to go into effect this week, no definite schedule was obtainable from distributors in the Detroit area.

Mayflower Merges
With Lewis

ST. PAUL—Mayflower-Lewis Corp., manufacturer of domestic refrigerators and air-conditioning equipment, has been formed through consolidation of Lewis Air Conditioners, of Minneapolis, and Mayflower, Inc., of Lima, Ohio, according to H. J. Hunt, president of the new organization.

Manufacturing operations of the new concern will be carried on at Duluth Ave. and E. 7th St., here.

Mayflower, Inc., formerly manufactured a complete line of domestic refrigerators, while the Lewis firm produced only air-conditioning equipment.

Officers of the new corporation are: Harry J. Hunt, president; Lawrence M. Butler, vice president; Fred C. Geiler, treasurer; James E. Knight, secretary; Stanley C. Marshall, chief engineer.

Trade Code Planned
By Cleveland
Distributors

CLEVELAND—As their first step in helping to correct refrigeration trade practices in this area, the executive committee of the Cleveland Wholesale Appliance Association set out Monday to formulate a code of ethics for the guidance of member organizations in conducting their business.

The wholesalers' association, only recently formed, gives the city a double-barreled approach to its appliance merchandising evils. Retailers have been together in the Cleveland Retail Appliance Association for about a year.

At an organization meeting last week, wholesalers voted condemnation.

(Concluded on Page 2, Column 1)

Potter to Use Distributor
Setup in Big Cities

CHICAGO—C. H. Slauter, Inc., has been appointed distributor for Potter Refrigerator Corp. in Chicago and seven surrounding counties.

The Slauter Co. maintains a large display room at 330 S. Wells St. The company distributed Chambers ranges before taking on the Potter line of refrigerators.

This appointment follows a newly inaugurated policy which provides an exception to the Potter direct-to-dealers merchandising plan. In large metropolitan areas, the company's policy has been broadened to admit establishment of a distributor-dealer setup.

Indianapolis Dealers
Form Association

INDIANAPOLIS — One hundred Indianapolis appliance dealers met here recently to launch plans for an organization to create good will and to establish improved business ethics. L. O. Rainier, manager of the appliance department of the Banner-Whitehall Co., is temporary chairman of the organization.

C. H. Domhoff, manager of the Guarantee Tire and Rubber Co., has

(Concluded on Page 2, Column 3)

January Sales
of 181,800 Units
Is New RecordGain of 45% Is Shown
Over Record-Breaking
January Last Year

DETROIT—Establishing a new all-time record for the month of January, manufacturers of household electric refrigerators sold 181,800 units to distributing outlets in all parts of the world in January, an increase of 45% over the record of 125,400 units set in January, 1936.

Fifteen member companies of the Household Refrigeration Section of the Refrigeration Division of National Electrical Manufacturers Association reported sales of 172,758 units to distributing outlets in January. This compares with the 116,630 units sold by Nema member companies in January last year.

Members of the Nema division who reported refrigeration sales in January of this year include: Apex, Crosley, Fairbanks-Morse, Frigidaire, General Electric, Gibson, Kelvinator, Leonard, Norge, Servel (export only), Stewart-Warner, Sunbeam, Uniflow, Universal Cooler, and Westinghouse.

The sales of the reporting companies include units manufactured for the following concerns: Major Appliance Corp., Montgomery Ward & Co., Potter Refrigerator Corp., and Sears, Roebuck & Co.

Crosley Plans Building
To Replace Plant 'K'

CINCINNATI — Crosley Radio Corp. will erect a new structure on the foundation of Building "K," destroyed by a fire during the recent Ohio River flood, Vice President Lewis M. Crosley has announced. Work will start as soon as the debris is cleared away.

The structure, 500 feet long and 100 feet wide, will be one story high, and will be used for shipping and storage of radios, refrigerators, and washers, Mr. Crosley said. Cost of the building will be approximately \$100,000. Work will be done by the Ferro Concrete Construction Co. of Cincinnati.

Nash-Kelvinator Corp.
Elects Officers

DETROIT—C. W. Nash was elected chairman of the board, and George W. Mason was elected president of Nash-Kelvinator Corp. at a meeting of the board of directors held here last Thursday, Mar. 4.

Other officers elected at the meeting were H. G. Perkins, vice president; C. H. Bliss, vice president in charge of sales, Nash Motor division; N. Erik Walberg, vice president of engineering, Nash Motor division.

H. W. Burritt, vice president in charge of sales, Kelvinator division; R. B. Elliott, vice president of pro-

(Concluded on Page 2, Column 3)

6 Appliance Outlets
Appointed by F-M

INDIANAPOLIS—Appointment of six distributors to handle the F-M Conservador refrigerators, radios, and home laundry-equipment lines, has been announced by W. Paul Jones, general manager, Fairbanks, Morse & Co.'s appliance division.

New distributors, and sales managers in charge of their refrigeration activities, are: B. W. Smith Co., Cleveland, W. H. Wilson; Walding, Kinnan & Marvin Co., Toledo, A. J. Nellis; Klaus Radio & Electric Co., Peoria, Ill., Henry Klaus; Whitney Sporting Goods Co., Denver, L. B. Smith; Lorenz Co., Klamath Falls, Ore., George P. Davis; Koenigman Electric Co., Jackson, Miss.; G. M. Sugg.

Cleveland Wholesalers May Attack Factory Sponsored Trade-in Policies

(Concluded from Page 1, Column 4) tion of the practice of selling merchandise at "courtesy" or industrial discounts to employees of industrial concerns, as well as the practice of selling at wholesale to "sidewalk dealers," who have no place of business.

Refrigeration trade practices were selected for correction first, because the product will be in its greatest selling season during the next three months. After that, it is planned to draft fair trade practice codes for washing machines, gas ranges, vacuum cleaners, and radios, in that order.

Members of the committee working on the refrigeration code are R. J. Strittmatter, Apex Rotarex Corp., president of the association; R. H. Bechtol, Cleveland Distributing Co., treasurer; L. M. Evans, Elliott-Evans, Inc., vice president; G. M. Nutter, Mook Electric Supply Co., secretary; Walter E. Custis, Arnold Wholesale Corp.; H. H. Kennedy, Frigidaire Division, General Motors Sales Corp.; J. Q. Herron, the M & M Co.; J. H. Kirby, American Stove Co.; Tyler W. Carlisle, Strong, Carlisle & Hammond Co.; J. A. Fitch, Maytag Sales Co.; and R. J. Lewis, General Electric Supply Corp.

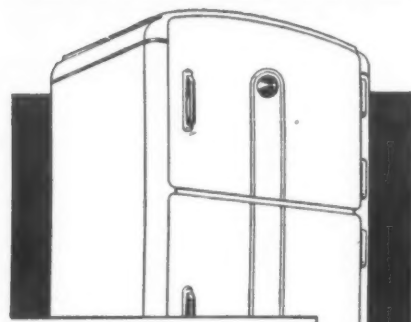
After they are drafted, the proposed set of refrigeration standards will be submitted to the association's membership for approval and ratification. The same procedure will be followed in formulating the other appliance codes.

A lively discussion of the distributors' part in helping solve the trade-in problem followed the reading, at last week's meeting, of a letter from the retail appliance dealers' group, in which it was said that, since distributors control list prices, advertising appropriations, and other standardized dealer helps, they should also set standards on trade-ins, carrying charges, and other considerations.

In the letter, the dealer association promised to do all in its power to maintain fair trade practices as suggested by the wholesalers' group.



Swing AWAY FROM REPAIR SERVICE!



Keep ALL Your Profit With COOLERATOR

No costly service problems when you handle the Air-Conditioned Refrigerator! You pocket the entire profit on every Coolerator sale. And sales are easy:

- **LOW PRICES:** From \$39.75. Big family size only \$79.50.
- **EXCLUSIVE FEATURES:** Coolerator uses ice in a totally different way... is completely air-conditioned with washed, humidified, circulated cold air... no danger of mingling food odors... foods stay fresh, no covered dishes needed... ice cubes in only 5 minutes.
- **COMPLETE LINE:** From 2 1/2 cu. ft. capacity to huge 50 cu. ft. commercial model.
- **NATIONALLY ADVERTISED:** Now adopted by more than 300,000 homes.

A profitable new line for you... write, wire or telephone today for full facts:

The COOLERATOR CO., Duluth, Minn.

Swing OVER TO Coolerator
The Air Conditioned Refrigerator

and urged distributors' consideration of the Ohio Fair Trade Act as a means of controlling resale prices and other practices.

Regulation of trade-in policies is a matter of dealer-distributor cooperation, it was decided after more than three hours' of discussion, during which it was suggested that first one, then the other, bore the brunt of responsibility.

Refrigerator spokesmen were generally agreed that trade-ins were not, as yet, a serious problem, while washing machine and radio representatives classified their fields as definitely trade-in businesses. One refrigerator man estimated that not more than 2,000 used electric refrigerators were traded for in this district last year, during which sales of new units totaled almost 35,000.

While the problem will doubtless become more serious in the future, this spokesman classed as the present malpractice the subterfuge of some dealers in calling an ice box a "mechanical refrigerator," and trading for it as such.

Factory trade-in policies are often a deterrent to distributors in formulating local merchandising standards, it was stated. General Electric, Kelvinator, and Frigidaire were among refrigerator manufacturers mentioned in this class. Particularly, the annual "Friends of Kelvinator" campaign was cited as an instance in which owners of old machines may trade them for new units at generous allowances.

Suggestions made to assist in solving the trade-in problem included: elimination of all trade-ins; a guarantee of dealer margin, because trade-ins, for the most part, are only a subterfuge for price cuts; and filing of trade-in terms, with strict dealer adherence to them.

George W. Walker, executive secretary of both wholesalers' and retailers' organizations, was asked by the distributors to sound out dealer views on a system of standardized trade-in allowances.

Applicants for membership in the wholesalers' association include the following 17 companies:

Maytag Sales Co., Cleveland Distributing Co. (Easy washers, Spartan), Apex-Rotarex Corp., Frankelite Co. (Crosley, Conlon), M & M Co. (Grunow, Motorola), Mook Electric Supply Co. (Westinghouse, RCA radio), Tappan Stove Co., Elliott-Evans, Inc. (Electrolux), General Motors Sales Corp. (Frigidaire), Strong, Carlisle & Hammond (Norge, Philco), Westinghouse Electric Supply Corp., Arnold Wholesale Corp. (Leonard, Zenith), American Stove Co. (Magic Chef), Tinnerman Stove & Range Co., Graybar Electric Co. (Thor, Bosch), General Electric Supply Corp., and Cleveland Cooperative Stove Co.

Carrier Gets Contract On U. S. Capitol Job

WASHINGTON, D. C.—A \$566,928 contract to complete the air-conditioning system in the U. S. Capitol building, home of the Senate and House of Representatives, has been awarded to Carrier Corp.

The new equipment will extend the 1928 Carrier installation, which operated only in the chambers of the Senate and the House, to include all the offices, corridors, committee rooms, the former U. S. Supreme Court room, Statuary Hall, restaurants, and the famous Dome, landmark of the Capitol. Vice President John N. Garner's office is among these.

The equipment includes dehumidifiers, fans, pumps, cooling and heating coils, filters and other coordinated machinery, as well as extensive duct systems.

Hearings Open Today on N. Y. Anti-Utility Bill

ALBANY, N. Y.—A public hearing will be held today (March 10) on the bill sponsored by Assemblyman Max Turshen, Brooklyn, and designed to prohibit gas and electric corporations from manufacturing, selling, leasing, or otherwise dealing in appliances for household use.

The measure, introduced on Feb. 2, was called up for discussion by Chairman John S. Thompson of the Assembly public service committee after several requests from groups of retail appliance dealers, who are working for its passage.

New Nash-Kelvinator Officers Elected

(Concluded from Page 1, Column 5) duction, Nash Motor division; H. E. Long, vice president of purchasing, Nash Motor division.

H. A. Lewis, treasurer; H. J. Melum, secretary; G. V. Egan, assistant secretary and assistant treasurer; G. H. Eddy, assistant treasurer; W. R. Crosett, comptroller; L. J. Holly, assistant comptroller, Nash Motor division; J. J. Timpy, assistant comptroller, Kelvinator division.

Members of the board of directors, elected at a previous meeting in Baltimore, are:

Mr. Mason, Mr. Nash, Mr. Perkins, P. J. Ebbott, vice president of the Chase National Bank, New York City; Ernest W. Stauffen, Jr., vice president of the Manufacturers Trust Co., New York City; H. T. Pierpont, Worcester, Mass.; and J. T. Wilson, Kenosha, Wis.

Indianapolis Dealer Group Organized

(Concluded from Page 1, Column 4) been appointed chairman of the code committee by Mr. Rainier. Members of the committee are: R. E. Sloan of the Pearson Co., Inc.; T. F. McMurray of T. F. McMurray & Son; N. H. Vogel of the Vogel Brothers Electric Co.; and E. M. Lawrence of the William H. Block Co.

Ralph B. Fisher of Fisher Brothers heads the membership committee. Other members include Milton Albershard of the A. C. Radio & Electric Shop, and H. F. Geiger of the Geiger Co.

Henning Heads New Kelvinator Outlet

(Concluded from Page 1, Column 3) Kelvinator branch have been dropped, and the new firm will function strictly as a wholesale organization. The new company took over the personnel as well as the control of the former Kelvinator outlet.

In addition to Mr. Henning, officers of the new organization include: Paul Belzer, secretary and treasurer; "Cash" Laufferweiler, sales manager; Joseph Dohany, Joseph Considine, and Charles Landy, district representative.

Mr. Henning, a native of Canada, spent several years in the employ of the Canadian and British governments before entering the refrigeration business in 1927. He is chairman of the electric refrigeration division of the Electric League of the Niagara Frontier, and has been a Kelvinator branch manager since 1931.

Mr. Belzer joined the Kelvinator organization at Pittsburgh in 1929, and came to Buffalo in 1933. Mr. Laufferweiler started as a Kelvinator salesman in Lima, Ohio, in 1924. He joined the Buffalo organization in 1930.

ReDisCo Officers Are Elected

DETROIT—At a meeting of the board of directors of Refrigeration Discount Corp. held here recently, the following officers were elected: G. W. Mason, president; G. V. Egan, executive vice president and secretary; H. A. Lewis, vice president and treasurer; H. G. Perkins, vice president; A. N. Willis, assistant treasurer.

G-E Scheduled to Begin Bargaining Conferences

NEW YORK CITY—Representatives of the General Electric Co. and the United Electrical and Radio Workers of America, an affiliate of the Committee for Industrial Organization, were scheduled to meet March 8 at the company's New York offices to discuss collective bargaining on the basis of demands recently presented by the union.

Announcement of the impending conference was made last week by Gerard Swope, G-E president. Mr. Swope said that W. R. Burroughs, vice president in charge of manufacturing, will be principal spokesman for the company, with James B. Carey, president of the union, representing his organization. The result of the negotiations will very likely affect the 60,000 employees of the company.

A blanket increase of 10 cents per hour for all employees, including salaried workers; increased compensation for certain shifts; revision upward of bonuses; and elimination of all forms of the "group incentive or speed-up system" of payment will be discussed, according to Mr. Carey, following his request for a conference last week.

Negotiations will primarily concern wage and working conditions in the Schenectady plant, but a committee elected by the union in January to draw up a proposed basis for bargaining on a scale affecting all G-E plants will also participate in the conference. This committee, in addition to Mr. Carey, includes E. G. Bunting, business agent of the union's local at Fort Wayne, Ind., and A. L. Coulthard, business agent of the Lynn local.

An eight-point set of demands was drawn up by union representatives at a meeting in Schenectady in January, at which delegates from various locals were present.

The Sun Never Sets on
EXTRA DRY ESOTOO
and V-METH-L!

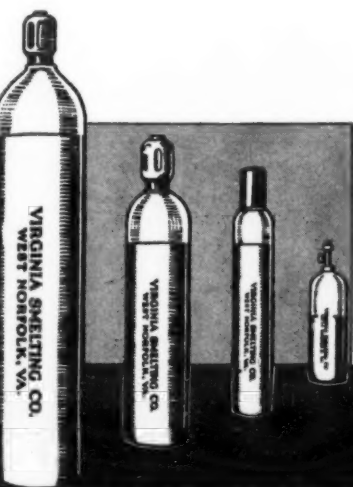
Speedy deliveries from 72 convenient distributing points

Not only do you get *what* you want when you order ESOTOO or V-METH-L, but you get it *when* you want it. And that's important. Through our far-flung network of 72 distributors the world over, Virginia Smelting is able to give immediate delivery service to Refrigerator Manufacturers and Service Engineers whenever fine refrigerants are needed *in a hurry*.

And what excellent and reliable refrigerants ESOTOO and V-METH-L are! Pure, clean, and *absolutely dry*, due to a process exclusive with us. These refrigerants come in all sizes of containers—from a conveniently small hand-cylinder to a tank car.

Remember Virginia Smelting Company's ESOTOO and V-METH-L when next you order refrigerants—and *remember* the prompt delivery service we offer to all our clients, anywhere.

The coupon below will bring you interesting further information.



F. A. EUSTIS, Sec'y, VIRGINIA SMELTING CO., 131 State St., Boston, Mass.

Send me the literature I have checked. I am interested in receiving any additional literature on Electrical Refrigeration you may issue from time to time.

- Folder: Extra Dry ESOTOO (Liquid Sulphur Dioxide)
- Folder: V-METH-L (Virginia Methyl Chloride)
- Folder: Transferring from large to small cylinders
- Circular: Physical properties of various refrigerants

Name.....

Street & No.

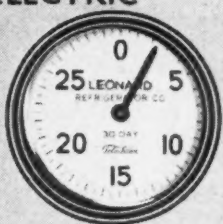
City & State

VIRGINIA SMELTING CO.
WEST NORFOLK, VIRGINIA

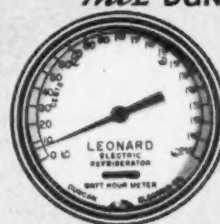
LEONARD — ECONOMY

See how little it costs to operate
a 1937 LEONARD ELECTRIC

This LEONARD ELECTRIC
REFRIGERATOR HAS
BEEN OPERATING
THE NUMBER OF
DAYS INDICATED
ON THIS TELECRON
CLOCK



This DUNCAN REGISTERING
METER SHOWS HOW
LITTLE IT HAS COST
IN ELECTRICITY TO
RUN THIS LEONARD
(Figured at 3¢ per
Kilo-watt hour base rate)



HERE'S HOW LEONARD DEALERS ARE TELLING AN

Economy Story

THAT REALLY

CONVINCES THE BUYER!



Leonard's Master Dial —
the year's most out-
standing refrigeration
development — leads a
list of convenience fea-
tures that never fail to
get instant acceptance
for this sensational
more-for-the-money
refrigerator.

Every prospect is interested in economical operation —
and every electric refrigerator claims to be economical.

But look how Leonard dealers back up this claim. Into
the cabinet being demonstrated is plugged the above
Economy Indicator. One dial shows the number of
days the Leonard has been operating. The other shows
the cost of the electric current consumed. There's proof
of economy. And it Convinces buyers.

It is only one of the many things which 1937 Leonard
dealers have in addition to a refrigerator that practi-
cally sells itself on sight. It's one of the many
reasons why Leonard Sales are breaking all records.

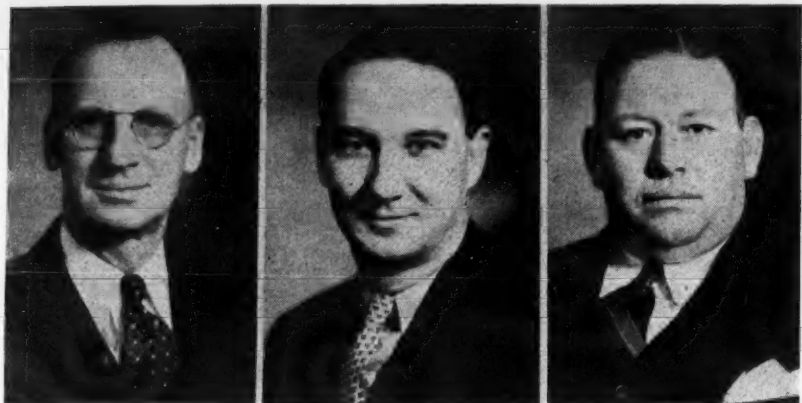
LEONARD REFRIGERATOR, Division of Nash-Kelvinator Corporation
Detroit, Michigan

LEONARD ELECTRIC

WITH
THE

Master Dial

They Distribute Kelvinators in Buffalo



Appliance Wholesalers, Inc., is the name of the new Buffalo distributorship which has succeeded Kelvinator's branch operation in that city and these are the three men that run it: W. E. Henning, president; Paul A. Belzer, secretary and treasurer; "Cash" Lauferweiler, sales manager.

Frigidaire Reports Convention Attendance Up 18%

DAYTON—Largest attendance totals ever recorded at the annual conventions of Frigidaire division, General Motors Sales Corp., were chalked up in January and February with an overall increase, for the nation, of 18%, reports Frank R. Pierce, Frigidaire's household division manager.

A total of 26,915 persons registered in at the sales meetings in the key cities of the country, Mr. Pierce said.

The conventions, conducted by three picked crews of Dayton sales department executives, started in middle January and ended late in February preparatory to national introduction of new products on March 7.

Those who attended the conventions were salesmen and supervisors from major appliance and specialty dealers, department and furniture stores and public utilities, together with many administrative and merchandising executives from Frigidaire's outlets.

the annual Westinghouse "Quota Busters" convention.

"Elmer," of "Where's Elmer?" fame gained at the initial Quota Buster convention last year, is a tall, genial lad who prefers to leave his selling problems at home when he goes traveling.

He manages the refrigeration department of his father's store, however, and his apparently unstudied antics fail to hide completely the salesmanship which has kept his name around the top of the list for two consecutive years.

Westinghouse refrigerators, washers, and ironers, pianos and RCA radios are sold by the Music House, which has been established here since 1895, and which has operated as a Westinghouse dealership since 1932.

The firm employs seven salesmen, who are paid on a straight salary basis and receive no commissions or bonuses on their sales, Mr. Eshelman states. It also employs three servicemen.

Approximately 10% of the refrigeration sales which he made during the past year were trade-in deals, according to Mr. Eshelman.

List Compiled from Tax Records Aids 'Bill' Lundy

Consistent follow-up on the direct mail list of 5,000 names which he compiled from the chamber of commerce files, from courthouse records of tax payers, and from his customers, is what W. J. Lundy, head of the Lundy Hardware Co., Sandusky, Ohio, claims helped him sell 112 Westinghouse electric refrigerators and be included in the Westinghouse "Quota Busters" club for 1936.

Mr. Lundy, who has been in busi-

ness for the past 18 years and is known to people around town as "Bill," employs no outside salesmen. He depends on store traffic for sales, and to stimulate store traffic, he uses newspaper and theater advertising, in addition to direct mail.

To provide a more attractive setting for the appliance lines which the hardware store carries, Mr. Lundy recently remodeled his store. Lines carried in addition to Westinghouse refrigerators and washers, are Detroit Jewel ranges, and Apex washers.

NO TRADE-IN PROBLEM

This star salesman-dealer doesn't find that trade-ins present much of a problem. He pays between \$5 and \$10 on old ice boxes in sales where customers want trade-in allowances, but says that boxes are easily disposed of since there is a heavy demand for them among the cottage owners at nearby summer resorts.

Farmers whose homes are not equipped with electricity also offer a market for selling ice boxes which he buys on trade-in deals, says Mr. Lundy. He had had only three electric refrigerator trade-ins during the last four years, two of which were re-sold at a profit.

Most of the refrigerators which he sells are 6, 7, or 8-cu. ft. size models, according to Mr. Lundy. The firm carries 5-cu. ft. boxes, but sells few of them, he says.

Chief drawback which dealers face in Sandusky, this Westinghouse dealer reports, is that resulting from the fact that local manufacturing firms allow their employees to place orders for appliances through their purchasing departments, buying the

(Concluded on Page 6, Column 1)

— HOW SUCCESSFUL DEALERS OPERATE —

Leading Sellers of Westinghouse Line in '36 Describe Sales Getting Methods

(Continued from Page 1, Column 3) is also a "partner" in the business—but her part will become apparent later.

Building his whole sales story around the all-electric kitchen, Mr. Rogers has an operating kitchen in his showroom, and holds regular demonstration schools there. In the original small store there was little room for such a display, but the company's present quarters in a downtown building owned by the Odd Fellows lodge were built to Mr. Rogers' specifications, and the kitchen occupies a prominent spot in the scheme of things.

The Rogers sales crew does very little canvassing. Most prospects are obtained through newspaper advertising, movie trailers, attractive store displays—and the store demonstrations, most effective of all.

MRS. ROGERS PRESIDES

These demonstrations, held in the Rogers model kitchen, are presided over by Mrs. Rogers, herself a home economist of no mean reputation in the territory. Mr. Rogers, of course, is always in the office.

Under the plan, from six to eight housewives are invited to visit the showroom. There, they put on aprons and prepare a regular meal, with Westinghouse equipment, under the tutelage of Mrs. Rogers. But the women do all the work, to give them a first-hand knowledge of how the equipment is operated.

After the meal is prepared, the men of the families come down for dinner and help eat it. With both husband and wife before him, Mr. Rogers goes to work—and his sales show that the method gets results.

CHECKUP YIELDS PROSPECTS

Another potent source of leads—and sales—is the regular 90-day free check-up which his service department makes on all users in the territory. This, he says, is a great stunt, and has more than paid for itself time after time.

Knowing that the store is interested in having the equipment operating properly makes the user feel very friendly, and service men are

trained in intelligent questioning as to neighbors' interest in the various appliances.

Regarding salesmen, Mr. Rogers says the greatest need of the industry today in his territory is for "kitchen specialists"—men who not only know how to sell the complete kitchen line—ranges, refrigerators, laundry equipment—but who also understand how to cook, wash, and iron.

Are such men hard to get? Ask Mr. Rogers. He's willing to pay as high as 15% to men who meet those qualifications, and can produce.

ROGERS' TRAINING PLAN

The average dealer can't afford to train these men, Mr. Rogers says—it takes too much away from his own selling time. For obvious reasons, these men also cannot be put on a salary basis until they learn the ropes—that's too costly.

So he has a plan. Salesman training, in the end, is the manufacturer's and distributor's job, he says. All the dealer should be is an employer. With the proper cooperation between the three parties concerned, enough trained men should be at the dealer's call at all times. Let the manufacturer and distributor share the expense of training the men, and have them available for shifting around the territory when, as, and if they're needed.

Well-trained men would be kept busy the year around, he believes, and the increased sales efficiency resulting from such training would more than offset the expenses involved. But large scale training is needed, and that's why it's a job only a distributor or manufacturer is equipped to handle.

Inexperienced men would make the best "kitchen specialists," in Mr. Rogers' opinion, because they have no preconceived selling bugaboos to overcome.

TOUGHER SALES EXPECTED

The company expects to be right at the top in sales in its territory all through this year. But sales will come harder, Mr. Rogers believes,

because: (1) there will be more and stiffer competition; (2) buying will be more shrewd; and (3) the public is becoming better educated on electrical appliances.

Tougher sales require better salesmen, and that's why Mr. Rogers has broached his training plan. Whoever takes it up first, he believes, is going to reap considerable of a cash reward.

'Elmer' Eshelman Combines Fun with Salesmanship

H. N. "Elmer" Eshelman of the Eshelman Music House in St. Joseph, Mo., had 150 electric refrigeration sales as credentials of admission to

DETROIT VALVES Improved



DURING the last ten years a continuous engineering development program has added many important refinements to Detroit Expansion Valves. The new group of major improvements announced here will put the 1937 Valves far ahead of any predecessors. These improvements will benefit all concerned—distributor, installer and user.

- 1 An improved seal where tubing joins the power element. Provides an absolutely tight joint and permits more abrupt bending of tubing to facilitate installation.
- 2 A new hex at the outlet connection and the addition of a square boss at the inlet—simplifies installation by providing proper wrench surfaces for making connections.
- 3 Smaller feeler bulb on the No. 673 (same size as that used in the past on the No. 674) makes neater and quicker application without sacrificing sensitivity.
- 4 Large capacity Thermostatic Valves—Nos. 781, 783 and 785—supplied with flanges and interchangeable tail pipes for sweat joints. Eliminates one joint and one fitting at each connection and likewise provides a simple means of securing proper inlet and outlet sizes by changing removable sweat joint tail pipes.

NO CHANGES—in the operating mechanisms which continue to provide service-free operation. Non-corrosive Deluballoy needles and seats and Duraflex Bellows—Detroit Lubricator Company's past contribution to the art of Expansion Valve manufacture—will continue as standard equipment for 1937.

DETROIT LUBRICATOR COMPANY

DETROIT, MICHIGAN, U. S. A. • 5900 TRUMBULL AVE.
NEW YORK, N. Y.—40 WEST 40th ST. • CHICAGO, ILL.—816 S. Michigan Ave.

DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

Canadian Representative—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, Montreal, Toronto, Winnipeg

AVAILABLE AT LEADING JOBBERS THROUGHOUT THE COUNTRY

Look for the yellow carton with the familiar trademark!



Remember DOOR GASKETS WEAR OUT, TOO

Few refrigerator parts are subjected to such hard and continuous wear as door gaskets. Nor are there many parts more vital to safe and economical operation. Thousands of doors are in need of gasket replacements.

Here is an opportunity to offer a service that is both in demand and highly profitable.

Miller makes it easy for you to get this business. Their simplified line of 20 gasket types enables you to meet 80% of all replacement needs. Years of specialized experience in this field assure you a product of proper design and highest quality.

Be prepared. Send for illustrated price list. If not obtainable through your local jobber, write direct.

THE MILLER RUBBER COMPANY, INC.

Akron, Ohio



You'll make
more money
with
C. I. T.

C. I. T. BUSINESS BUILDER

The localized
national
finance
service

Vol. 1. No. 1

Published by C. I. T. Corporation, unit of Commercial Investment Trust Corporation, capital and surplus over \$100,000,000

MARCH, 1937

C. I. T. Limited Recourse Plan Offers Way to Boost Your Volume

BUDGET PLANS TOP SEVERAL DEVELOPMENTS AFFECTING APPLIANCE MERCHANDISING

The C.I.T. Budget Plans may rightly be called the "capstone" of several important developments which have affected appliance merchandising. To enumerate these: first of all, F. H. A. facilities were withdrawn. Second, C.I.T. rates to purchasers were reduced. Third, C.I.T. extended longer maturities. Fourth, many new appliances were approved

for financing.

And now C.I.T. dealers may finance radios, refrigerators, automatic heating equipment, ranges, electric washers, ironing machines, water heaters, dish washers, commercial refrigeration, air conditioning, room coolers, and other eligible appliances under the same schedule of rates. Truly an opportunity for you!

Why I prefer to deal with C. I. T.

—by a Michigan Dealer



Michigan dealer says:—"In the flush periods prior to 1930 it was easy for all finance companies, as well as banks to extend credits, but we have found very

few companies willing to carry on in times of stress such as we have experienced in the past several years. During this period, however, I found C.I.T. willing to go the limit to help.

"In the past few years C.I.T. have proved that they are not just a 'fair weather' company, but one that can be affiliated with in the hard going."

C.I.T. Advertising wins new friends for you

In the Saturday Evening Post, Collier's, Time and large city newspapers across the continent, C.I.T. is printing friendly messages on the story of instalment buying.

This good-will advertising is as valuable to C.I.T. dealers as their own. It tells all about the C.I.T. Budget Plan and how automatic heating, refrigerators, radios, and other household appliances may be acquired on the "easy payment plan" by the average family.



Dealers like to put business through C.I.T. because their customers have confidence in C.I.T. and appreciate all that C.I.T. has done and is doing to make the good things of life available to everybody.

Combination Sales . . . A selling convenience

C.I.T.'s terms simplify and aid the sale of two or more acceptable articles to one customer, in combination. A single C.I.T. contract is all that is required. This is often a great convenience both to customer and dealer. And here's an important selling point: the term of contract on a combination sale is determined by the appliance entitled to the longest maturity. For instance, a radio entitled to 16 months and a refrigerator to 36 months—sold together get the 36 months' maturity.

QUICK, PERSONALIZED SERVICE THROUGH YOUR LOCAL C.I.T. BRANCH

"At your service" are a total of 160 C.I.T. offices—throughout the country—one in every important trading area of the United States. Through these local C.I.T.'s you secure on all your instalment sales that quick, personalized service that C.I.T.'s organization makes possible.

You can go after more business free from problem of pyramiding contingent liability

THE new C.I.T. "Limited Recourse Retail Finance Plan" is of tremendous importance to you right now as you swing into the refrigerator season. You'll be amazed—and delighted—at the benefit this new development in C.I.T. service will be to your business.

Briefly, this new plan means that leading refrigerator, appliance and radio manufacturers and their distributors offer through C.I.T. local branch service an instalment sales finance plan which limits your liability at no cost to you.

Here's how it works. Instead of your having a contingent liability that continues through 12, 18, or even 36 months on major appliances, you are released from your endorsement when the purchaser has paid C.I.T. the first four monthly instalments!

You can see how this benefits you: under limited recourse plans, dealer credit requirements by the finance company are lower than



The C.I.T. Limited Recourse Plan is already financing active buying of electric washers, water heaters, radios, refrigerators, and other appliances.

formerly. More dealers can qualify for financing service. All dealers may do a larger volume of business, adding to their capital while reducing their liabilities.

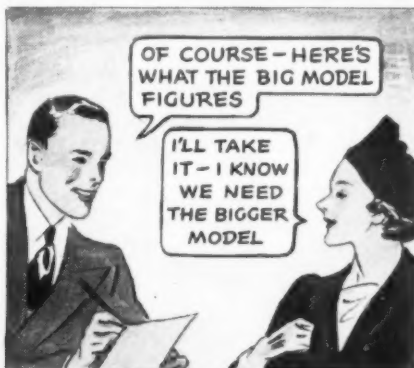
Also: You don't have to worry about a finance company discontinuing your line because of volume of paper outstanding. There is no holdback to tie up part of your profit. You receive 100% cash advance at once. Your capital remains fluid; your current assets increase and are not frozen beyond immediate reach.

This plan operates AT NO COST TO YOU. Your C.I.T. branch will supply full details.

USE the BUDGET PLAN

Certainly, the thing to do this Spring is to feature the C.I.T. Budget Plan for your entire line . . . extend it to buyers of all kinds of home equipment.

THE ARGUMENT THAT CLINCHED THE SALE — by Agnew —



The philosophy of Dealer Dan

Time is money . . . so save both by concentrating all your financing into one simplified account with C.I.T.

Your responsibility for "dealer service" does not end with the cessation of your financial responsibility brought about by C.I.T.'s "Limited Recourse."

If you wish to build friends in your community—and get your share of "word of mouth" sales so important to your success—you must "service" your merchandise for the duration of its guarantee. Don't take the slacker's path of careless indifference—stick to your job of maintaining "Purchaser Good-Will" and it will pay you.

PHONE OR WRITE FOR YOUR COPY OF C. I. T. PLAN

Ask the C.I.T. branch office about the "Limited Recourse" Plan.

C. I. T. CORPORATION

NEW YORK • CHICAGO • SAN FRANCISCO

Closing the Peerless—G-E Agreement



M. W. "Mel" Knight (standing), general sales manager of Peerless of America, Inc., looks on as H. T. Hulett, assistant commercial manager of General Electric's refrigeration department, and W. M. Timmerman, manager of the G-E commercial refrigeration engineering department, complete arrangements whereby Peerless will make G-E coils.

Peerless Will Build G-E 'Spinner' Coils

(Concluded from Page 1, Column 2) ner" tubing, the open coil construction which is claimed to afford a more positive air circulation to cut out excessive frost accumulation, and fin construction of double thick aluminum with no applied finish to peel off and deteriorate.

Four metal locking strips, force-fitted into the fins, are said to add strength and rigidity, keep the fins in alignment, and eliminate sharp corners.

Tubing is the continuous one-piece type, with the fins automatically "pinch-locked" to the tubing, insuring an absolute metal-to-metal contact. Short radius bends in the tubing are made by a method of crimping the inner surface of the tube, which construction feature is said to avoid excessive thinning of the tube's outer wall and to get away from restriction of the refrigerant's passage.

The term "spinner" is derived from the inner construction of the tubing, where a metal ribbon causes the

liquid refrigerant to "spin" or "whirl" as it passes through the tubing.

This spinning and whirling action is said to create more contact of the refrigerant with the inside surface of the tubing because it agitates the refrigerant and increases its velocity.

Standard models in the G-E "spinner" line are intended primarily for use in all types of walk-in coolers and service cabinets. Compact "top fin" models are fitted for use in top, or rear bunker display cases. Bare pipe cooling units with spinner feature are available for a wide variety of requirements.

In the new G-E icemaker cabinets, designed for the dual purpose of freezing ice and refrigerating a cabinet as well, ice is frozen in the center section while the outside finned surface provides refrigeration for the cabinet.

The new "directed-air" units in the G-E line are specially designed for application in walk-in coolers. These units consist of a spinner-tubing evaporator, polished aluminum multi-louvered air "directors," and a self-contained drip pan.

Krich Goes to Europe for Vacation Tour

NEWARK—Harry Krich, founder and chairman of the board of Krich-Radisco, Inc., local Kelvinator distributor, sailed recently aboard the S.S. Rex on a four-month vacation abroad. Mr. Krich was accompanied by his wife. The couple plan to visit France, England, Italy, and the Near East.

Max H., Paul R., and B. Gordon Krich, sons of the distributor, staged a farewell party for their parents at the Waldorf-Astoria Hotel in New York, on the eve of the ship's departure.

Alamo Co. Urges Dealers To Contact Farm Market

SAN ANTONIO, Tex.—Alamo Distributing Co., local Crosley distributor, is urging its dealers to take advantage of the market among the farmers in their respective vicinities.

Reliable statistics, the distributorship claims, have shown that 4,240,000 of the country's 61,800,000 farmers are prospects for appliance sales. Government reports indicate that 35% of America's farmers had an average income of more than \$2,700 in 1936.

— PROFITABLE SALES METHODS —

Two Successful Westinghouse Dealers Make Records without Canvassing

(Concluded from Page 4, Column 5) equipment straight from electrical equipment manufacturers, and thereby obtaining special discounts for them.

Under such a setup, he says, the employees naturally take advantage of getting the special discount, and won't buy through a dealer store.

R. C. Pollock Makes Lone-Wolf Record of 138 Sales

Although he employs no salesmen, does no outside canvassing, and uses no "high-pressure" selling tactics, R. C. Pollock of the R. C. Pollock Co., Van Wert, Ohio, sold 138 Westinghouse refrigerators during 1936, and earned himself a place among the nine top Quota Busters for the second successive year.

Depending strictly on floor traffic for his leads, Mr. Pollock claims that a substantial volume of store traffic has been built up largely through the contact work of the three radio service men whom he employs. The



R. C. POLLOCK

men service about 3,000 radios in Van Wert county.

In the four years that he has carried electric refrigeration in his store, Mr. Pollock's sales have shown a 100% increase each year. Of his 1936 sales, 108 were to city residents, and 30 to farmers. Sixty percent of his sales, he says, are on a cash basis.

Holding frequent auctions at his store to clear his stocks of used radios, which he has taken on trade-in deals, also serves as a traffic-building sales method, Mr. Pollock finds. Radios taken as trade-ins are serviced and sold at these auctions. Each serviced set carries a 30-day guarantee.

On refrigeration sales, Mr. Pollock's policy is not to give flat rates for old ice boxes, but to take the box, sell it, and apply what he receives towards the sales price of the customer's new electric refrigerator.

He sells the ice boxes to farmers living in districts off the main power lines. During the entire 1936 selling season, he had only two sales in

which electric refrigerators were taken as trade-ins.

But Mr. Pollock doesn't depend entirely upon his service men or auctions to bring new customers into his store. He also uses newspaper and theater advertising, and he maintains a stock of 20 floor models to attract the passer-by trade.

Keeping his store open evenings until 9 o'clock during the summer selling season is another of the things that helps boost his sales, Mr. Pollock believes. During the rest of the year he opens his store at 9 a. m. and closes it at 7:30 p. m.

In addition to Westinghouse refrigerators, the Pollock Co. sells Westinghouse ranges, laundry equipment, and water heaters, RCA Victor radios, and Easy washers.

Customer Tips Lead to Sales For Small-Town Dealer

In Bunkie, La., a town of 3,000 people, W. A. Keller, owner of Keller's Hardware & Implement Co., sold 100 Westinghouse refrigerators last year—without benefit of canvassing.

As his firm name implies, Mr. Keller sells just about everything in the farm equipment field, and his contacts with farm people have been a good source of refrigeration business. Practically all sales, he says, were made through tips from users or friends—for in a small town like Bunkie, neighbors find out about a refrigerator prospect almost as soon as he becomes one.

It's worth money to Mr. Keller to know who's in the market, and he pays tips for "tips," but a large majority of good prospects, he says, are turned in by friends of the store, whose only interest is in seeing that the bulk of the community's refrigeration business keeps coming his way.

To offer such people commission, Mr. Keller says, would be an insult to their friendship—so, often, he doesn't. But he remembers the favor, and the next time that friend comes in to buy something, he's apt to find he received a little more than he

paid for. In that way, "friendship" accounts are kept in balance.

Another highlight of Mr. Keller's selling tactics is that he's dead against demonstration selling. No homes get refrigerators on approval from him, no siree! They make a regular deal, cash and terms—and if they don't like the refrigerator Mr. Keller takes it back and returns their money.

Selling that way, he says, keeps the records straight. If people want a refrigerator, he reasons, they'll buy it—a home trial isn't necessary. And if they get a refrigerator and decide they don't want to keep it, turning it back is the simplest thing in the world, and nobody's feelings are hurt.

Cooperation from Louisiana Power & Light Co. salesmen has been a big help in setting his 1936 sales mark, Mr. Keller says, but he closed fully 80% of his last year's sales personally. And the sales he doesn't close, he passes on before delivery is made.

Mr. Keller operates a "complete" one-man service department. The man has received factory training, and does all the company's service work on all types of appliances.

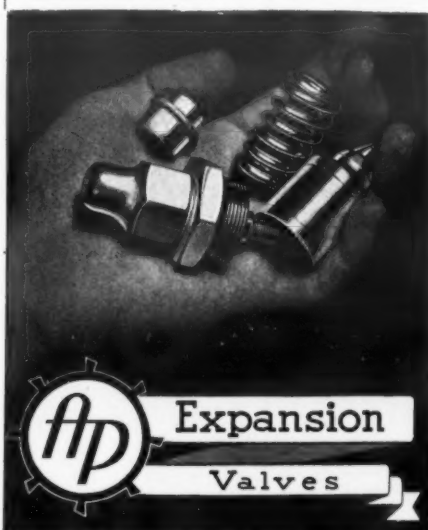
Selling in a rural community sometimes taxes Mr. Keller's ingenuity, but more often than not he comes up with the sale, although some of his "deals" are, to say the least, unusual.

Poultry, produce, cattle—all are acceptable for payment, provided the deal depends on them. On one of the four used electric refrigerators he traded for and sold last year, Mr. Keller accepted five Jersey cows as payment in full.

"I made a nice profit on that deal, too," he says.

Submerged Westinghouse Freezes Flood Waters

HUNTINGTON, W. Va.—Among the unusual stories resulting from the recent flood is one concerning a Westinghouse refrigerator, buried for five days under water. When recovered and opened, the food compartment liner was crusted with ice.



EASY TO DISASSEMBLE AND CLEAN

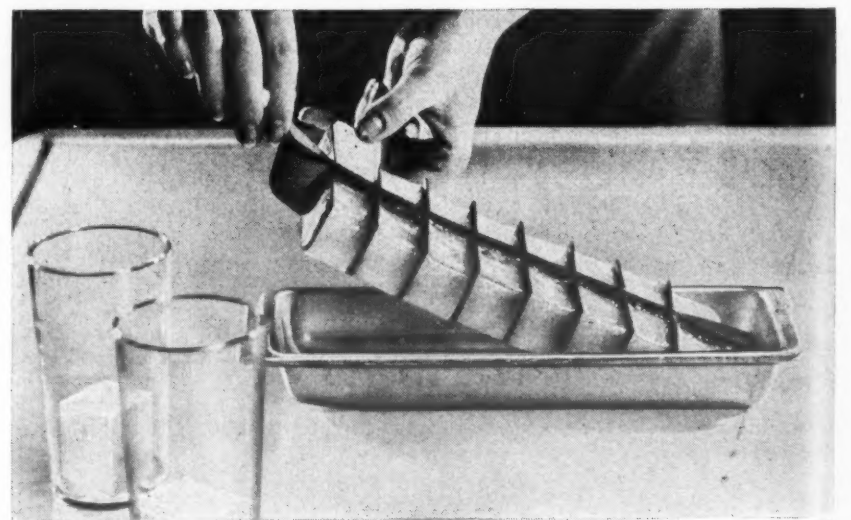
Simply remove large hexagon nut on bottom of valve and parts drop into your hand. A-P Expansion Valves are available in a full range of sizes up to 15 tons "Freon" Capacity, and for all modern low-pressure refrigerants.

Automatic Products Company
2450 North 32nd St., Milwaukee, Wis.

It's New! It's Sensational! Presto Tray with Magic Finish and Rubber Grid



Inland's inventive genius brings you a new and dramatic combination of magic-finish metal pan of patented contour with new rubber grid convenience. There's sheer magic in this tray that has no levers, links, or cams to freeze tight—no sharp edges to cut—yet gives split second release of tray and cubes. Here's the tray sensation of the year, with its magic-finish metal that prevents sticking and freezing in. Its patented contour gives instant release of ice cubes. Yes, Presto Tray is new and different.



A slight touch and the magic-finish metal Presto Tray slips out of the sleeve. This secret magic-finish prevents sticking. Press the rim of the pat-

ented contour and lift out the rubber gridful of ice cubes—ready for use... one at a time or a whole trayful. Simplicity itself... no handles—no levers.

Magic Release

This 10-second Presto Tray demonstration rivets your prospects' attention on the fast freezing advantages and full ice making capacity of your refrigerator. It enables your salesmen to show prospects how to get all the benefits of all the ice your refrigerator can freeze—without fuss or bother. Capitalize on the sales-closing advantage of this action-getting new Presto Tray. Insist that your new refrigerators come factory

equipped with Presto Trays in every ice compartment.

INLAND MFG. DIVISION
General Motors Corporation
DAYTON, OHIO

THE MAGIC FINISH
PATENTED CONTOUR

Presto Tray

WITH RUBBER GRID

Patented Contour above means Patent Pending

THE MASTERCRAFT ADJUSTABLE PAD AND CARRYING HARNESS FOR SAFE DELIVERY OF AUTOMATIC REFRIGERATORS

Pad and harness ADJUSTABLE to many sizes and styles of cabinets. Economical—Efficient. Sturdily constructed, easily applied. Name of refrigerator attractively lettered on pad without charge.



Pad (Adjustable) \$9.50 ea.
Harness (Adjustable) \$6.00 ea.

The Pad and Harness are separate.

Individual carrying straps \$1.75 each and up. Write for 1937 Folder & Prices on entire Pad Line.

BEARSE MANUFACTURING CO.
3815-3825 Cortland Street, Chicago, Illinois

We put Everything we had into it—



NEW BEAUTY
AND STYLING

A GREATLY
IMPROVED
MECHANISM

NEW WRINGER
DESIGN

A COMPLETE
LINE

NEW AND BETTER
AGITATOR

A GREAT
SELLING
PROGRAM

Yet its enthusiastic acceptance has left us about speechless!



The new line of Kelvinator electric washers and ironers has gone over. And while we feel that these products fully deserve the measure of acceptance they received, we also feel that we owe a sincere vote of thanks to the dealers in the field for their

good words—and for their orders.

We thought we had designed and built a line of washing machines that individually and collectively were far in advance of anything on the market.

We thought that no one could honestly say we had merely brought out just another line. And its acceptance proved we were right.

Every dealer interested in electric washing machines should see this new line at the nearest Kelvinator distributor's showroom. They are well worth seeing.

There's new beauty and styling. There's the new and exclusive Kelvinator PRESSURE-ATOR wringer and exclusive FIN-FLEX agitator. There's an improved and simplified mechanism. The line is complete—and there is a real national magazine and radio advertising and selling program behind it. Prices are right—to meet any kind of competition.

Visit your Kelvinator distributor now—and see for yourself why Kelvinator washers and ironers have stepped out far ahead.

KELVINATOR, DIVISION OF NASH-KELVINATOR CORPORATION • DETROIT, MICHIGAN

Kelvinator

ELECTRIC WASHERS AND IRONERS



Parts Makers Invited To Participate in Springfield Show

SPRINGFIELD, Ill.—About 25 refrigeration parts manufacturers, and about 50 manufacturers of electrical and wiring supplies, are being invited to participate in an electrical and refrigeration show to be held here around the first of April under the sponsorship of United States Electric Co., distributor of electric supplies, according to R. S. Dobbins, general manager.

Manufacturers who participate in the exhibit will be expected to arrange their own displays in the booths assigned to them. Mr. Dobbins says, and to help defray the expenses of the show by contributing approximately \$10 and the time of one of their men.

Appropriate educational speeches will be made on problems pertinent to refrigeration and other fields of electricity, says Mr. Dobbins.

Henry-McGee Co. to Handle Electrolux in Texas Area

BROWNWOOD, Tex.—Henry-McGee Co. has been organized to take over the sales of Servel Electrolux refrigerators in Brown County. Officers of the firm are R. J. Henry, formerly with J. C. Penny Co., and H. A. Henry, formerly with Austin-Morris Co., Brownwood.

Kiser Named Supervisor At Pearson's Store

INDIANAPOLIS, Ind.—Appointment of William L. Kiser as supervisor has been announced by C. L. Kittle, manager of the refrigeration and stoker departments of Pearson's here.

Inland introduces New Fast Freezing, Easy Release Cube Tray

DAYTON—A new fast-freezing tray for mechanical refrigerators which combines a "magic-finish" metal pan of patented contour and new rubber grid convenience has been introduced by the Inland manufacturing division, General Motors Corp.

Called "Presto," the new tray, its manufacturers claim, is different from any other tray on the market. It is constructed without levers, handles, or cams. Because its finish prevents sticking and "freezing in," the tray slides out of the freezing compartment instantly. Then the rubber gridful of ice cubes can be quickly released by pressing on the rim of the tray's patented contour.

According to H. C. Berkeley, Inland sales manager, the Presto tray gives the user the best advantages of both rubber grids and metal pans. It gives quick freezing, plus the convenience of full-sized ice cubes which can be removed quickly, without fuss or bother, and without shattering the cubes or wasteful melting of the ice.

In addition to the new-type trays, Inland will continue to manufacture flexible rubber trays and grids.

Westinghouse Test Kitchens Show Current Consumption

MANSFIELD—In reports of 72 "test kitchens" made by housewives to Westinghouse Electric & Mfg. Co. on its 1937 models, average current consumption per 24 hours has been .66 kwh., according to P. W. Endriss of the company's sales promotion department. Average number of times the refrigerator door has been opened daily is 42, the reports show.

U. S. Bureau Issues Report of Tests on Ice Refrigerators

Editor's Note: The following is taken from the 1936 report of Dr. Louise Stanley, chief, Bureau of Home Economics, United States Department of Agriculture.

The refrigeration studies (of the Bureau of Home Economics) have been continued with the emphasis on no-load performance tests of individual refrigerators. Additional electric refrigerators were tested, two for the Electric Home and Farm Authority.

Tests of two kerosene units were completed, and substantiated the results reported last year, namely, that a kerosene refrigerator in a no-load test at 90° F. used about 12 gallons of kerosene a month with an average internal temperature of 43°.

Since many ice-cooled refrigerators have been greatly changed in type and improved in quality since the bureau published detailed results for ice-cooled cabinets in 1930, tests of seven ice-cooled cabinets from seven different makers have been carried on in cooperation with the National Association of Ice Industries.

These refrigerators were tested in constant temperature rooms at 90° F. and also at 70°. Internal temperatures, relative humidity, and ice-melting rates were determined as well as the effect on refrigerator temperatures as the ice in the refrigerator decreased. The cabinets were also observed for sweating when the room temperature was 90° and the relative humidity was gradually increased to 90%.

At 90° F. room temperature this group of ice-cooled refrigerators maintained an average internal temperature of about 49½°, while the average temperature in the space designed for milk was about 48½°. The average ice-melting rate was about 26 lbs. per day or 780 lbs. per month.

For the group of ice-cooled refrigerators mentioned in the 1935 report, these values were respectively 53°, 46°, and 900 lbs. per month.

For the group of electric refrigerators mentioned in the same report the values were, respectively, 43°, 46°, and 50-kwh. a month. However, the older group, both the electric and the ice-cooled, had an average food-storage space of 6.4 cu. ft., while the newer group had 5.4 cu. ft. Thus the ice-melting rate per cubic foot of food-storage space is virtually the same in both cases, but the average temperature is very definitely improved.

There are two reasons why the temperature in the milk-storage space has not improved. All of the refrigerators in this recent test were of the front-icer type, which gives a smaller temperature range within the cabinet. Another reason is that in some cases the newer refrigerators are so designed that the indicated place for milk storage is, unfortunately, not the coldest place. This second difficulty could be corrected by redesigning the shelves and their supports.

The newer refrigerators by a change in design of the ice compartment and accessories, keep the temperature more nearly constant as the ice melts down than did the older type. In those of the newer type the temperature rose a little more than 2° as the ice melted from 80 lbs. to 30 lbs., while the corresponding temperature rise in a typical refrigerator of the older type was nearly 5°.

Specialties Distributing Co. Moves to New Showrooms

DETROIT—Specialties Distributing Co., Grunow distributorship here headed by the four Turnbull brothers, has moved both warehouse and showroom from its old location on Jefferson Ave. to new and larger quarters at 5840 Woodward, where the firm now has one of the largest and most modern showrooms in the city.

"The new location is more advantageous in every respect," declared Leonard F. Turnbull, vice president. "Not only are we more centrally located, but the a.c. current with which we are supplied here greatly simplifies refrigerator and radio service and repair. Only direct current was available at the old location."

"The most important feature of our new location," Mr. Turnbull explained, "is that we may now cooperate more closely with our dealers. It will be easier for dealers who do not handle complete displays to bring their prospective customers in here where the entire line may be seen."

Tydings Bill Changes Proposed by NRDGA Before Approval

NEW YORK CITY—National Retail Dry Goods Association will approve passage of the Tydings-Miller bill providing for price maintenance on brand items, now under consideration in Congress, if the bill is amended as suggested by Irving G. Fox, counsel to N.R.D.G.A., at the recent hearing of the House Judiciary Committee on the bill, according to Channing E. Sweitzer, N.R.D.G.A.'s managing director.

Mr. Fox, at this hearing, filed a brief in opposition to the measure, but stated that the Association would withdraw its objections if the bill were amended so as to permit contracts or agreements in interstate commerce to prohibit resale of branded merchandise below the net delivered invoice costs of such merchandise.

The bill as it now stands provides for absolute price maintenance by manufacturers of branded goods in interstate commerce. Mr. Sweitzer pointed out that the Association has seriously considered various types of

loss-leader-selling, and is willing to support the measure if amended.

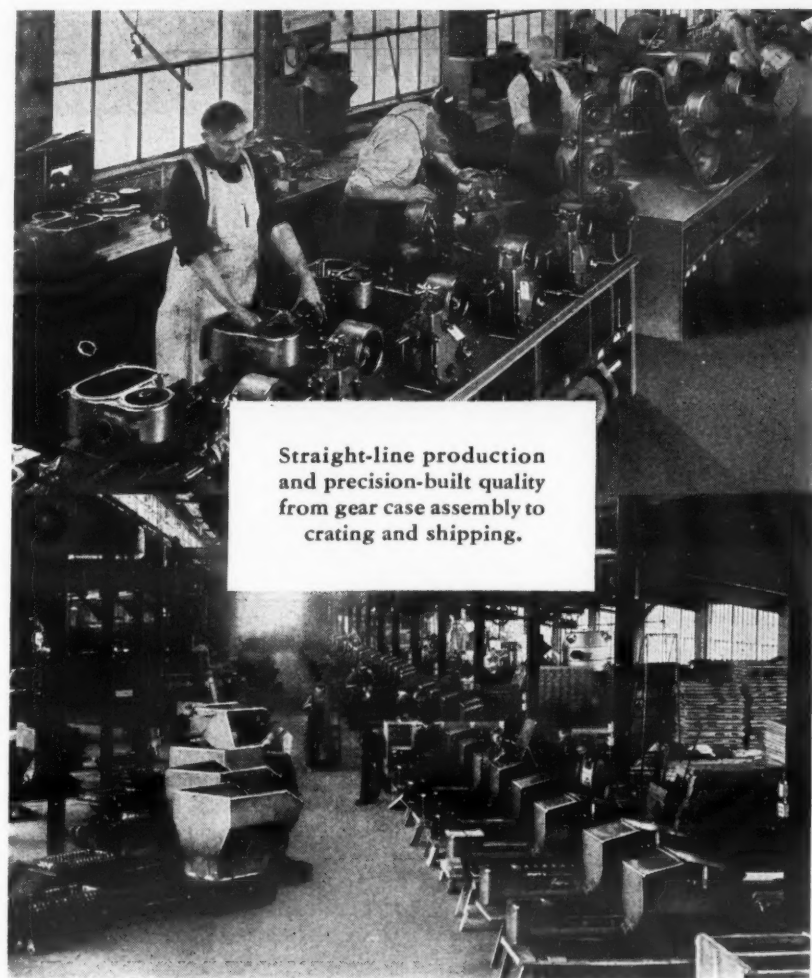
"N.R.D.G.A. favors prohibition of retail sales below a minimum of the net invoice cost excepting under prescribed conditions including but not limited to clearances and liquidations of business," Mr. Sweitzer stated. "The Association opposes the Tydings-Miller bill as it now stands, just as it has for 25 years stood counter to any measure which would artificially maintain or fix prices, and work to the detriment of the general consuming public. A prohibition against sales below net invoice cost under usual conditions is not regarded as constituting price fixing, but would act to eliminate a practice in retail distribution which has in many cases been strongly attacked. The Tydings bill, if amended to eliminate this practice, will be in line with previous sentiment of N.R.D.G.A., and will not be opposed by it."

January Westinghouse Sales Up 40% over Last Year

MANSFIELD—Sales of Westinghouse electric refrigerators during January, 1937, were 40% ahead of those for the same month last year, officials of Westinghouse Electric & Mfg. Co. report.

Combustioneer

IS PRECISION BUILT—NOT MERELY ASSEMBLED—UNDER ONE ROOF



Straight-line production and precision-built quality from gear case assembly to crating and shipping.



Combustioneer dealers find volume and profits snowballing to new peaks because they sell satisfaction resulting from the precision-built quality of a pioneer maker.

Every single step of Combustioneer's straight-line production, from the testing of raw materials to the final operating test of completed units is under one roof of a great newly enlarged plant.

Combustioneer makes no parts for other makers—the entire research and manufacturing facilities of this organization are devoted to maintaining

Combustioneer leadership in advanced design and features which assure user satisfaction.

That's why Combustioneer dealers in 11 foreign countries and all over the U. S. A. know that the 250,000 people now enjoying Combustioneer comfort, convenience and economy are creating bigger sales for them. Get the whole fascinating story of Combustioneer's exclusive franchise proposition. Write us to have a representative call on you. Address, Combustioneer Division, The Steel Products Engineering Company, Springfield, Ohio.

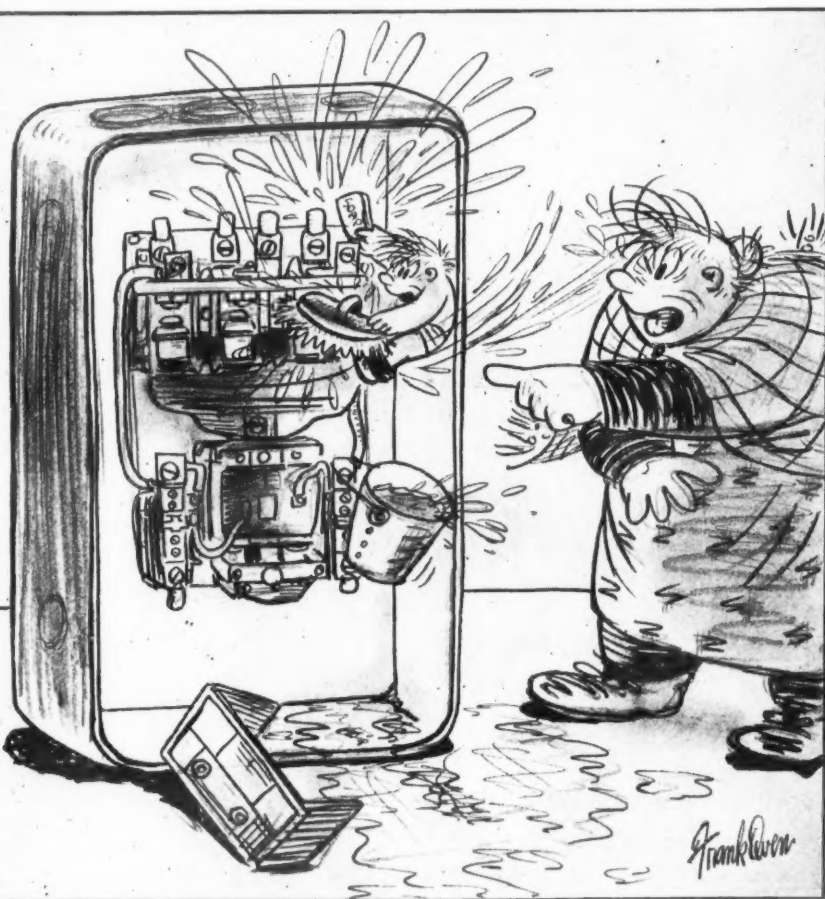


THIS YEAR IT'S

Combustioneer

AUTOMATIC COAL BURNER

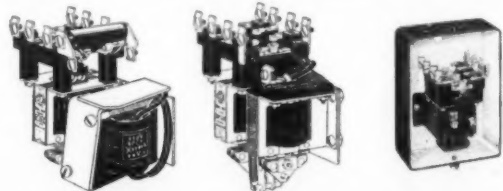
FOR HOMES, APARTMENTS AND FACTORIES



"No, no, Philbert—those contacts never need any cleaning!"

Don't make Philbert's mistake—the contacts of Allen-Bradley solenoid starters never need "dressing." Filing contacts is harmful, for it wastes valuable contact life. Another advantage of Allen-Bradley solenoid starters and relays is their low pick-up and drop-out voltage. They close with a positive snap and will not open up, even though line voltage regulation is poor. Write for "The Story of the Solenoid Starter." Allen-Bradley Company, 1313 S. First Street, Milwaukee, Wisconsin.

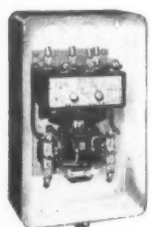
Bulletin 700-200 Solenoid Relays



With low voltage transformer.

With mechanical hold-in latch.

With cabinet cover removed.



Bulletin 709 solenoid starters for squirrel-cage motors.



Bulletin 709SP solenoid starters for single phase motors.



ALLEN-BRADLEY

SOLENOID MOTOR CONTROL

Some Flint Dealers Say Consumers' Power Trade-in Allowances Work Hardship; Others Defend Utility's Policies

BY WILLIAM H. LONG

FLINT, Mich.—Evidences of a clash of opinion and dissatisfaction between some of this city's smaller refrigeration dealers and its leading utility, Consumers' Power Co., over trade-in allowances became apparent during a recent visit to several appliance dealerships in Flint. Five months ago (in the Sept. 30, 1936, issue) the NEWS reported the beginnings of the present dispute.

Consumers' Power Co., which handles the Frigidaire line, is the target of the attacks by some dealers, while others fail to find any major faults in the utility's policy. Several dealers handling competitive lines are the progenitors. The charge: allegedly allowing a 10% reduction on the list price of new refrigerators for trade-ins, plus a 5% discount for cash. Officials of the utility disclaim any such sales policy.

To briefly outline the Flint situation: Flint is a city of about 165,000, overwhelmingly industrial, and home of the great Buick, Chevrolet, and Fisher body factories. About 40 outlets do business in the city, most of them selling only a few refrigerators each year, a few doing a good business.

Sales are about 75% (perhaps more) on the time payment plan; auto factory workers are the principal buyers, and pay out of income on appliance purchases. Last fall a NEWS reporter, after calling on a number of dealers, reported price-cutting accusations and the springing up of about 15 "mushroom" dealerships during 1936. And the Consumers' Power Co. does the lion's share of selling in Flint.

ALLEGED '10 & 5' OFFER

One old, established dealer declared that Consumers' had been "roping in" customers with the offer of 10% off the purchase price of a new Frigidaire for trade-ins, plus an added 5% reduction if they paid cash for the new box. Independent dealers were stated by this man to be up in arms about it. Several had gotten together, he said, and decided to present a united front to the utility and demand a curtailment or modification of the alleged policy. No action had been taken as yet, but it would be in the near future, this dealer maintained.

At this point, the manager of another Flint refrigeration outlet came in to confer with the first-named dealer about the situation. From a corner conference was heard snatches of conversation concerning the alleged rebate offer of Consumers' Power Co., talk of "chiseling" and wholesale price-cutting on trade-ins by competitors, and general evidences that the dissatisfaction among Flint dealers—at least, the group which the conferees claim to represent—is more than the usual dispute where competition is intense.

Presenting their side of the case to the writer, these two dealers claimed that the utility's trade-in allowances had been in effect for several months, that independent dealers could not meet such offers, and that thereby their business was suffering, especially since the sit-down strikes had curtailed sales to such a degree that the sale of a refrigerator was "news" in Flint.

Various repetitions and ramifications of these statements were heard from other dealers in the city, most of them proprietors of small shops.

UTILITY MAKES DENIAL

When questioned regarding these charges, H. W. Courville, superintendent of the utility's appliance sales, and C. J. Crusey, of the sales department, denied absolutely that their firm was offering to deduct 10% of the purchase price of a refrigerator on any trade-in, or that Consumers' Power Co. offered an additional 5% reduction for cash.

"Our trade-in policy," declared Mr. Courville, "is this: during our 'Year-End Sale,' which we conducted during November and December last year, we offered the purchaser a reduction of 15% on the cash price of a new Frigidaire or electric range on his old equipment, provided that his old equipment could be sold so that our net loss wasn't over 5%."

"We have taken in quite a lot of old equipment this way, making money on some of it and losing money on other deals. We refinish

and recondition all this trade-in material in our own shop, and then sell it as reconditioned merchandise."

During 1936, said Mr. Courville, the Consumers' Power Co. paid out over \$15,000 to Flint dealers as bonuses for sales of equipment placed on its power lines. For each sale of a water heater, electric range, or gas range sold by an independent dealer, the dealer was paid a bonus of \$10, with the distinct understanding that this amount was not to be deducted from the customer's purchase price in any manner.

Mr. Crusey declared that business and personal relationships between independent dealers in the city and the utility had always been pleasant, and that there was no foundation to the report that Consumers' Power

Co. was using questionable trade-in policies to secure sales. On the contrary, said Mr. Crusey, the utility was doing all in its power to encourage outside selling and aid the dealer wherever possible.

The sales manager of one of the utility's largest competitors declared that his company's relations with Consumers' Power Co. had been entirely amicable, and that he did not believe the charge of unethical trade-in practices to be well founded. He stated that many new rural power lines were being installed near Flint and that the complaining dealers might expect keen competition on the vital matter of trade-in allowances from a well-established firm.

A salesman at another larger dealership in the city declared that the same dealers who were accusing the utility of "chiseling" were themselves taking in "anything from grand pianos to bird cages" at \$50 to \$75 as trade-ins on new refrigerators. This man expressed the opinion that sales competition in Flint was getting "dirtier by the day," and that if it was not soon stopped all would suffer for it.

Extra Personnel Named By G-E in Drive for 'New American Homes'

NEW YORK CITY—W. B. Aurandt and W. P. Quig have been appointed field representatives for General Electric Co. in Boston and Philadelphia respectively, to act as liaisons between builders in their territory and the various distributors and offices of the company, according to Carl M. Snyder, manager of the G-E Home Bureau.

Mr. Aurandt has for several years been associated with G-E's appliance and merchandise department at Bridgeport, Conn. Mr. Quig was associated with Edison General Electric Appliance Co., Chicago, before coming to Philadelphia to manage the "New American" program in that territory last year.

This move is the first step toward consolidating G-E's recent activities in the new home building field, says Mr. Snyder. If present plans materialize, six other representatives will be appointed shortly to cover other sections of the country. A. J. Lee has been carrying on his activity in the New York area for more than a year.

Although the activities of these rep-

resentatives will not be strictly commercial, they will bring together the builders and the distributors of air-conditioning equipment, wiring and construction materials, lighting facilities, and home appliances.

This new campaign will naturally follow the path blazed by G-E's "New American" programs of the past two years.

The value of the demonstration home as an incentive to better building is not minimized in the present movement, but the prime purpose of the current campaign is to consolidate the gains in public favor won by the relatively spectacular "New American" promotion, and to make the services of G-E's Home Bureau available to every builder.

Through these Home Bureau representatives, G-E hopes to influence the planning of new homes along the principles of home building established during the recent "New American" campaign.

New Haven Dealer Will Handle F-M Line

NEW HAVEN, Conn.—Batter Appliance Co. has opened as a Fairbanks-Morse appliance dealer at 1172 Chapel St., here.

Again NORGE LEADS

IN LOW-TEMP Rollator Refrigeration

YOU HAVE A FUNDAMENTAL IMPROVEMENT TO SELL

THE introduction of a new engineering principle—the Rollator—started Norge on the road to a position of leadership.

Today, Norge introduces another advance—the greatest improvement in home food preservation since the introduction of the Rollator. The new Low-Temp Rollator Refrigerator—like the Rollator itself—is a fundamental advance. It will keep foods PRIME FRESH from 2 to 5 times longer with no increase in current consumption. Temperatures up to 20 per cent lower are maintained, together with humidity high enough to allow foods to retain natural moisture.

That's something to talk about—something to sell. Especially since the new Low-Temp Norge has all the important features of style, convenience—every practical use advantage that has been proved sound.

Get all the facts about Norge Low-Temp Rollator Refrigeration—the aggressive advertising and promotion program behind it. Liberal finance plans make it easy to be a Norge dealer. Write for details.

NORGE DIVISION Borg-Warner Corp., 606-670 E. Woodbridge St., Detroit, Mich.

ROLLATOR REFRIGERATION
(Domestic and Commercial)

•

GAS AND ELECTRIC RANGES

•

WASHERS AND IRONERS

•

WHIRLATOR OIL BURNERS

NORGE

Rollator Refrigeration

REG. U. S. PAT. OFF.

GAS BURNERS

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FINE-AIR FURNACES

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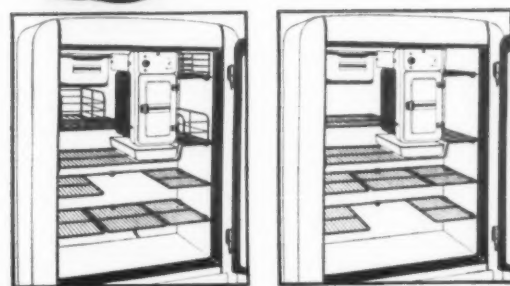
COAL STOKERS

•

AIR CONDITIONING

•

CIRCULATOR ROOM HEATERS



2 of the 9 New Flexible Interior Arrangements

Any woman can see at once the advantages of this new feature—an extremely easy method of adapting the shelves to meet ever-changing storage requirements. As many as nine different arrangements are possible in most models.

Stockholm, Capital City of Sweden, is the Venice of the North



Built on a series of islands in the romantic manner of Venice, Stockholm has an advantage over its Italian rival in being highly modern and much cleaner. It is one of the world's handsomest cities.

AROUND THE WORLD WITH GEORGE F. TAUBENECK

Copenhagen is but an all-too-brief plane jump from Rotterdam. Across the sea to Malmo, Sweden, is another airplane hop. An overnight train ride, and you're in up-to-date, hustling Stockholm.

Followers of Editor Taubeneck's world touring travelog in search of information on markets for air conditioning and refrigeration are taken on this fast ride in the current instalment of the "World Series."

Looking Down

To get a real conception of the difference between the three neighboring countries of Holland, Germany, and Denmark, one needs to get up into the air.

That sweet Douglas plane which took me from Rotterdam to Copenhagen flew low, and it was a clear, scintillating day. There had been a wild taxicab ride from The Hague to the great flying field a few miles beyond Rotterdam—after a last-minute cancellation had made it possible for me to get a seat—and I was too breathless to do anything but look out the window, and downward, for the first few minutes.

And for the rest of the journey I was spellbound.

Holland from the air is a series of neatly regular rivers, canals, dikes, lakes, ditches, and pools—broken up by patches of land. So much water there was, so many boats. The land was so flat, so green. Not an inch seemed to be wasted; nor did any of the water go unutilized.

Germany was something quite different. Factories belched dirty smoke into the cloudless blue of the sky. Smudged red brick and gray steel supplanted the quiltwork of blue and silver which had been Holland. Here was an industrialized country, one which made things. And it seemed old and weary.

Skimming over the chimney tops of Hamburg, we could see that a real city was humming below us. It may have been old, possibly even weary, but it was still active. Not a building of any size that wasn't exhaling that particular variety of sooty smoke which is a combustion product of German coal; nor yet any streets which weren't rumbling with heavy traffic.

After passing a series of smaller industrial beehives, the plane zoomed out over the sea, which was burnished with the gold of a smoldering sunset, gilding the placid water as if it were a great sheet of ice overlaid with gold leaf.

Then, Denmark. Cows and pasture and neat farm homes, and more cows. Thousands of them. All grazing contentedly. Taking a cue from the Holsteins, the whole countryside seemed peaceful and unhurried.

Farm buildings, homes and barns, were laid out in exact rectangular design, sometimes with a windbreak of trees forming one side. A few of these groups were protected by moats. Everything seemed in order, and functioning methodically.

Copenhagen

It was nearing sunset when we arrived in Copenhagen, and there were but a few hours to devote to a hurried once-over of this charming city

and its obviously admirable people. All too short it was, and some day I hope to return for a genuine visit.

Capital city and leading port of Denmark, Copenhagen consists of the eastern shore of the island of Zealand, and the western shore of Amager, with an excellent harbor between the two islands. It would appear to be a perfect set-up for a great port of trade.

Copenhagen seemed to be a modern metropolis embellished by old landmark buildings which are still useful, still in good taste.

Some of Copenhagen's most prominent buildings date back to the 17th century: the Exchange, topped by its magnificent copper dragon-spire; Holmen's church; and Trinity Church, on Kobmagergade street.

Rosenborg palace, another old-timer, advertises that it has a collection of souvenirs of the kings: jewels, furniture, china, crystals, and dresses. This palace-museum is open to the public; but was closed before my arrival.

Many magnificent buildings have been erected in the modern style: the Glyptothek, the City Hall, the castle of Christiansborg, and the State Police Building. Specimens of modern Danish architecture, which is related to the German, are seen on every hand.

Places of amusement are plentiful. There are any number of theaters, a permanent circus, night-clubs, golf links, and race courses, all of which may be seen on a quick automobile tour. Soccer football matches are held at the Stadion, and bicycle-racing at Charlottenlund. The bathing beach at Bellevue rivals the Tivoli amusement park (noted for its pantomime shows) as an all-comer attraction.

High Purchasing Power

Because of the unusually high purchasing power of Danish incomes, even the lowest-paid citizen of Denmark can own a home and live fairly comfortably, I was told.

On 10,000 kroner a year (about \$2,250) a man can buy an ample home with modern equipment without

squeezing pennies. A man with a smaller income buys his land on easy terms, and builds his home by degrees. First he builds the garage. He lives in that while he builds the house, then moves into the house while he installs electricity, gas, and water. At last he buys furniture, piece by piece.

It is said that there are no labor troubles in Denmark. The working man of Denmark feels that he is better off at home than in any other country in Europe today, and is proud of it.

Food is cheap, clothing is cheap—in fact, everything is cheap. He can dine at the Royal Danish Yacht Club any day in the week, and not feel out of his element. Even the wealthy dress simply.

Business section of the city centers around the Town Hall and the Central Railway Station. This open square is dominated by the striking Town Hall, which has a tall tower rearing toward the sky. There are numerous hotels, theaters, office buildings, restaurants and museums in this section.

Athens of the North

Castle Island, oldest part of Denmark, is separated from the rest of the city by canals and a portion of the harbor.

On this island are some of the oldest buildings in Denmark: the Royal Record Office, Royal Library, Theater Museum, the Royal Stables, and the Thorvaldsen Museum (which glorifies the works of Thorvaldsen—most famous of Denmark's sculptors).

Because of her many museums and art collections, citizens of Denmark call Copenhagen "the Athens of the North."

The name of Denmark struck chords in my memory as the land of the Vikings, the scene of Shakespeare's "Hamlet," and the home of Hans Christian Andersen, fairy-tale writer. It probably is a great many other things.

For example: various medical authorities have declared that Denmark is one of the best health resorts in the world. Because of Denmark's

position so near the land of the mid-night sun, during the summer months those Vitamin D rays are in evidence all but a few hours around midnight.

Riksdag, Denmark's legislature, is made up of the Folketing and the Landsting. The Folketing—the popular assembly—consists of 149 members, who are elected for a period of four years by universal suffrage. The Landsting, of 78 members, elected by the electors in the six districts into which the country is divided.

Land Ownership

As a pioneer in land legislation which seeks to supplant farm tenancy with ownership, Denmark has enacted several far-reaching laws during the past 40 years.

Of the country's approximately 11,000,000 acres, more than 75% are utilized for agricultural and horticultural purposes, so agricultural health is a vital factor in the national economy.

Experts regard land ownership in Denmark today as more secure than in any other European nation, for since 1919 there has been a general prohibition against the foreclosure of a mortgage without approval of the Ministry of Agriculture.

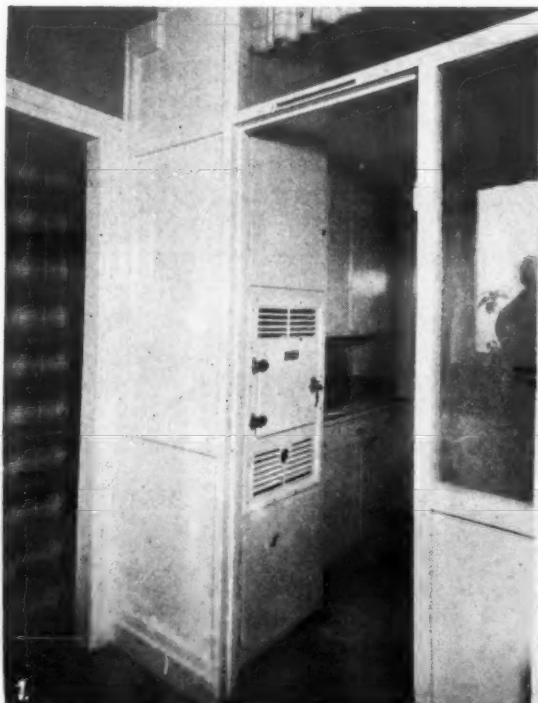
The great majority of Danish farms are owned by the farmers themselves. As long ago as 1910 only 7.5% were leased or tenanted, and this figure has been further reduced since that time by compulsory commutation of leases decreed by the government.

Movements for the establishment of new, small land holdings began in 1899, when an act of the Danish Parliament provided for land to be placed at the disposal of farm laborers. Following the passage of several "small holdings" acts, more than 16,000 individually-owned farms have been established through state loans and grants.

Most of these state loans amount to nine-tenths of the total cost of the holding, with low rates of interest and with loans repayable in installments over a long period.

(Concluded on Page 12, Column 1)

Built-In Kitchens Conserve Space in Modern Swedish Apartment Houses



Builders of Swedish apartment houses have been exceedingly clever in saving space, as the above pictures demonstrate. Electrolux designed and provided the built-in refrigerators.

THE AIR AGE

BY F. O. JORDAN

An Automotive Engineer Views Air Conditioning

511 Woodland
Detroit

Jordan:

Your column, the "Air Age" promises to be a very popular addition to the News. May I have the honor of being a charter member of this family circle by asking a question that has long been in the back of my mind?

Why doesn't somebody air condition the automobile?

I am by profession an engineer connected with one of our leading automobile companies, and at times also have evidenced a lukewarm interest in air conditioning. Knowing some of the problems involved in the production of automobiles, I can give numerous good reasons why the manufacturers of said machine have shown so little interest in cooling their own product.

What I don't understand is why the air-conditioning industry hasn't made any particular efforts to develop this particular phase of its own business?

Here is a field that is wide open; the technical angle is simple, and the answer is right in your laboratories. The problem of marketing the device may be a horse of a different color, but more difficult problems have been solved, much to the financial benefit of the man who had the initiative to go ahead.

The automobile has developed from the proverbial acorn to the mighty oak, and the mechanical problems are now pretty well in hand, with the result that our attention is now diverted more and more to the problems of comfort for the passenger. All possible phases but one have been worked on at great length.

We have "floating rides," soft reclining cushions, scientific ventilation, sensitive radios, and tricky hot water heaters that produce living room temperatures in your car on the coldest sub-zero day. But no thought has been given to comfort on a blistering midsummer afternoon.

Why doesn't some enterprising air-conditioning engineer work out a quarter-ton absorption system and use some of our vast amount of waste heat from the engine to cool our cars and make them the last word in comfort? At the same time I am sure that he would find at least a portion of the nation's wealth depositing itself in his bank account.

F. L. BENNETT

Answer: Both you and your "lukewarm" interest—welcome to the "circle." With the auto out of the "proverbial acorn" and into the "oak" stage, and with its mechanical problems now "well in hand" (skipping that jerky clutch in my new car), it certainly is problematical why there has been no collaboration of motorized and air-conditioned brains to result in summer comfort behind the steering wheel. Probably just the inertia of the highly conventionalized human mind.

The auto engineer's chief aim in life all these years has been to make the "damn thing run," while engineers with the air-conditioning taint in their blood have been living only to cool houses (and more recently, pullmans).

Industries frequently lag because of their tradition-bound leaders. Your idea about putting to work at absorption cooling, the motor heat now wasted, surely stamps you as being tradition-free. Perhaps your employer "would find at least a portion of the nation's wealth depositing itself in his bank account" from auto-air conditioning if you were in charge of such a development for him.

Will Conditioning Double Our Mineral Wealth?

Discovery of new gold fields with yields equal to 50% of all existing yields would be a sensation, not one of the kind to read about in the evening paper and so to bed, but an event which would mean the readjustment of existing financial structures, the realignment of present day nations, and the reorganization of life as it is lived upon this planet.

The possibilities of air conditioning in mines are no less than this, because this application of it already has resulted in an enormous increase in the effective mineral wealth of the earth by placing within the group of the human race, untold riches which, without the use of air conditioning, might just as well be in Mars, for all the good they would do for the citizens of the world.

This is no idle dream, for many air-conditioning installations now are in use in mining operations, not for the purpose of boosting production by air conditioning-installed employee pep, but because more ore is made available through the making possible of operations at depths so great

that the natural temperatures which obtain without air conditioning are more terrific than man can endure.

Thus the dollar value of air conditioning to the mining industry is not limited to the resultant increased capacity of the worker to work, for the extension downward to new fields below is comparable to the discovery of new mining territories of fabulous wealth.

The probable influence of such additions to the world's natural resources upon the financial structures of the future, upon the future wealth and power of nations, and upon tomorrow's standard of living, stagger the imagination.

As a mere scratch upon the surface of the future, consider the air conditioning for limiting temperature and humidity now installed in the African gold and diamond mines, and in the Morro Delho mines of South America, and the installation now being made in the Magma Copper diggings out in our own Arizona.

Working of the Robinson Deep in deepest, darkest Africa is made possible at its present depth of 8,500 feet by a 2,000-ton, 400,000-c.f.m. Carrier installation, with much greater depths now made possible by this system.

When the claim is contemplated that air conditioning has resulted in a 50% increase in possibilities of the African Rand Gold Field which now yields 50% of the world's gold, a vague idea of the importance of air conditioning to the wealth of the earth may be obtained.

At 8,000 feet down below the surface of Brazil, Carrier air conditioning is declared to create comfortable working conditions amidst natural environmental temperatures of 130° F., yet air conditioning makes possible the penetration to much greater depths where the terrific temperatures forever emanating from the seething, infernal regions down under are much higher even than this.

Normal conditions in the Arizona Magma Copper Mines, where the Carrier installation is not yet completed, range from 95° to 100° at 3600 feet. Even at this depth it has proven impossible to maintain acceptable conditions by the heretofore conventional method of forcing huge volumes of surface air through the shafts and galleries.

Is America closer to Hades than is Africa? One cannot help but wonder as Mr. Carrier points out that temperatures at 4,000 feet in Arizona are 10° higher than at double that depth in the dark continent across the Atlantic.

Also pointed out by Mr. Carrier are two problems peculiar to mine air conditioning in the extremely high humidities due to the prevalence of underground moisture, and the high temperatures (often in excess of 100° F.) of available condenser cooling water.

Reducing Friction at Duct Elbows

Since it is very desirable to maintain low air friction and noise levels in the central system type of residential air conditioning, it is interesting to note the effect upon air friction and noise of properly placed sweep sheets in duct elbows, where much of the friction originates in many installations.

Tests conducted by the Buffalo Forge Co. indicate that the use of sweep sheets results in considerable savings in air friction for the short radius elbow whose inside curve radius is about 20% of the radius of its outside curvature. For such an elbow the loss in velocity pressure indicated when no sweep sheet is used is in the neighborhood of 35%. When one sweep sheet is used, the velocity pressure loss is reduced to 16%, while the use of two and three sweep sheets brings the loss down to 12% and 7% respectively.

For longer radius elbows the use of sweep sheets becomes less beneficial so that in the case of elbows whose inside curvature radius is greater than their throat width (parallel to the curvature radius), the air resistance actually may be increased by the use of sweep sheets.

For the duct whose inside curve radius is about 25% of its outside curve radius, tests indicate that if one sweep sheet is used, it should be one third of the throat width from the inside curve; in the case of two sweep sheets they should be at ¼ and ½ of the throat width from the inside curve; in the case of three

sweep sheets the preferred locations are at the ¼, ¾, and ¾ points.

Art in Industrial Design

The following contribution is from L. S. Morse, who is executive engineer for the York Ice Machinery Corp., as well as president of American Society of Refrigeration Engineers.

"Art in Industrial Design has not always been recognized as such, though it has always existed to some extent. Henry Dreyfuss, the distinguished designer, says that design

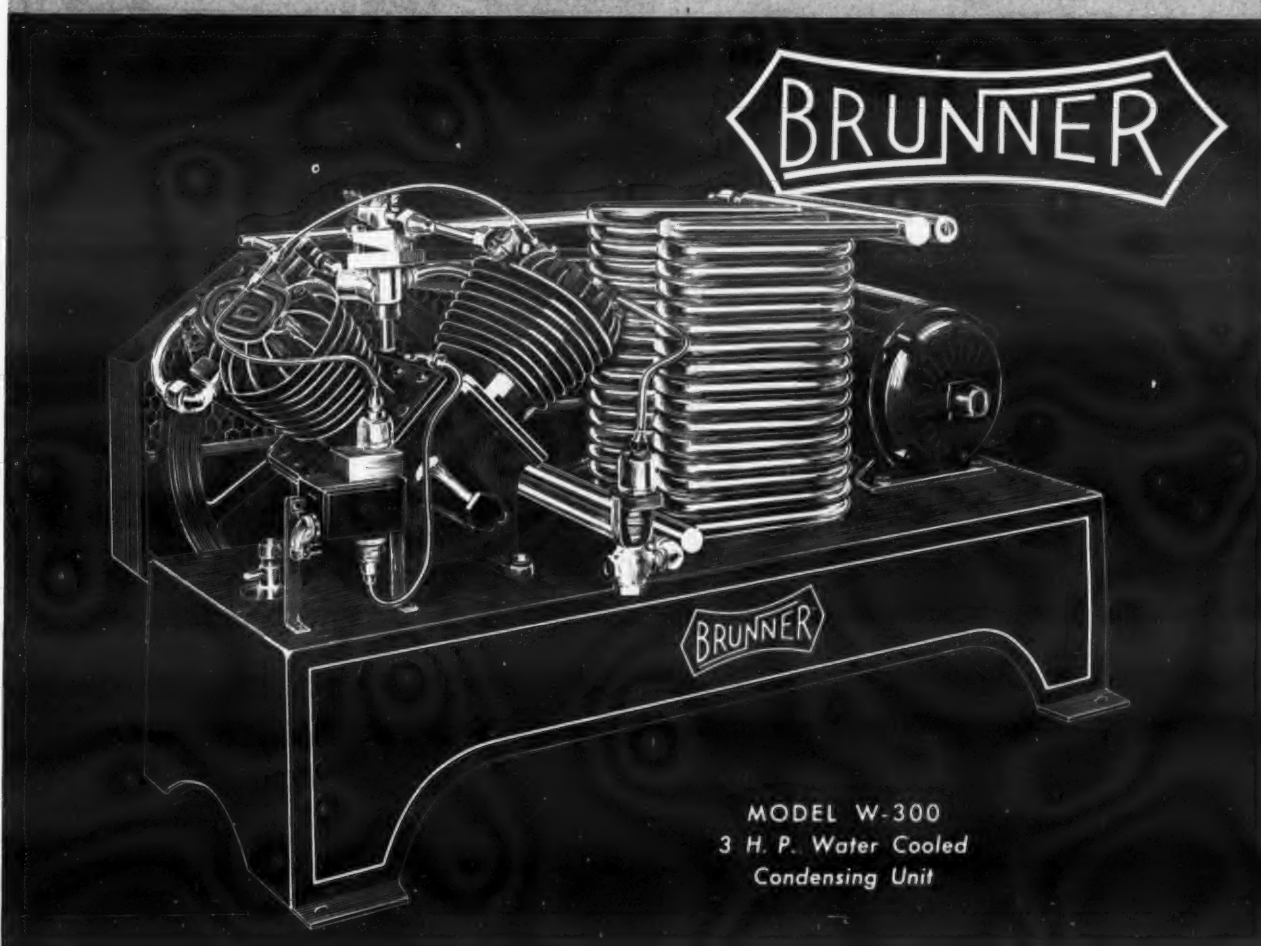
influenced by changing conditions assumes a form unique to the era in which it flourishes. Today we have a new expression in industrial or product design which is a natural outgrowth from machine-made mass-production methods. Modern industry gives new media for expression to a new kind of art and this new art serves as a powerful sales stimulus.

"Style and design have always been appreciated by the decorative and fashion industries and have exerted an important influence in many of the mechanical efficiency of their furniture and silverware. But art, by

and large, has not had a prominent place in those industries which were concerned principally with perfecting the mechanical efficiency of their machines or their product.

"However, competition in many industries has reached a point where there is only a small and disputed margin of efficiency of one product over another and consequently something has to be done to create sales appeal. The natural tendency then, is to improve the appearance of the product—in other words, present an artistic exterior that is pleasing to the eye."

THE DYNAMIC BALANCE OF RECIPROCATING PARTS INSURES SMOOTH, VIBRATIONLESS OPERATION



MODEL W-300
3 H. P. Water Cooled
Condensing Unit

Balancing the opposing masses of fast-moving metal in a complicated mechanism like the modern refrigeration unit is not the product of slide-rule computation... not a run-of-the-draftingroom problem. Dynamic balance—bringing each and every moving part into "mechanical accord" with every other part—this is the outcome of tireless research, intimate knowledge of refrigeration conditions, plus years of manufacturing experience. It is embodied in today's smooth-running Brunner units... Look into this Brunner feature before you make any decision on the best equipment to install! Watch a Brunner in action. Put your hand on the sturdy base. Feel the low minimum of vibration dynamic balance achieves. Then, consider the extra years of service it is bound to deliver. You'll find full details in the new Brunner Refrigeration Catalog, listing 47 condensing units, air and water cooled, for nearly all refrigerating and air conditioning installations. Write: Brunner Manufacturing Co., Utica, N. Y., U. S. A.

BRUNNER

BUILDS FOR *Greater* DEPENDABILITY

Sturdy, Substantial Nature of Swedish Architecture Reflects National Character



(1) The Royal Palace, which could pass for an American municipal school building. (2) State museum in Stockholm. (3) Hotel in Stockholm, photographed at midnight. (4) Vine-clad private home.

(Concluded from Page 10, Column 5)
Special legislation enacted in 1925 is regarded as the Magna Charta of Danish farming. These laws provided that an existing farm holding should in the future be continued as an independent holding, provided it have buildings and occupants who inhabit these buildings.

No part of the land of an agricultural holding can be leased for longer than a five-year period without special consent of the Ministry of Agriculture.

If the buildings of an agricultural holding should be damaged or destroyed by fire or otherwise, the owner is compelled by law to rebuild or repair the necessary buildings.

Denmark's Coinage

Denmark's monetary unit, the krone, has a par value of \$0.4537. It is divided into 100 ore.

The sole note-issuing authority in Denmark is the National Bank in Copenhagen, in whose policies the government has by law a controlling interest, which is vested in the person of the Minister of Commerce. He acts as chairman of the board of directors of the bank.

Although the importation of gold into Denmark is unrestricted, exportation is prohibited by an embargo

created on an executive order of the Minister of Justice, issued Sept. 2, 1931, for an indefinite period.

Since Jan. 31, 1932, silver has been on the free list of imports and exports. Silver was entirely abandoned as a monetary unit in 1924.

Hospitable Electrolux

Arrival in Stockholm was coincidental with the celebration of Midsummer Day, a national time of festivities which draws representatives of all Sweden to Stockholm for pageants, music, and dancing. It is the longest day of the year; and in Stockholm the sun was below the horizon for less than two hours.

All this provided an excellent chance to see the various breeds of Swedes in traditional apparel, and to observe them at play.

It also afforded Electrolux men a chance to entertain me. Dr. W. R. Hainsworth, vice president and laboratory chief of Servel-Electrolux in America, was there at the same time; and the two of us were dined, talked, and toured until we were ready to call it a week.

Nils Laurin, manager of the refrigeration department of Electrolux (which is also one of the world's largest manufacturers of vacuum cleaners, you know) probably did most to make our stay profitable. Managing Director H. G. Faulkner was also of particular assistance.

Others who gave us information—and time—included G. Sahlin, assistant managing director; A. Engberg, technical manager; S. Widdell, sales manager; M. Beckstrom, laboratory chief; and Gunnar Gruwe, manager of sales in Sweden.

All in all, it was as hospitable a crowd as any I've ever met in the air-conditioning and refrigeration industry—anywhere in the world.

Fairy Tale

The story of Electrolux is like a fairy tale. This ingenious mechanism for household refrigeration—the only successful absorption system which can be manufactured by mass production methods—probably ranks second to Frigidaire in number of refrigerators in use around the world.

It was invented by two college boys. These lads, B. von Platen and C. G. Munters, devised a working model of the first Electrolux as a project to qualify them for a degree from a technical college! They got the degree, all right, and a fortune, too.

Munters has never left the Electrolux fold, having worked ever since on refining and further developing the product. Platen, who is more or less a "Bohemian" of artistic temperament, has used his royalties to further his laboratory research into other problems—notably a direct current high voltage machine.

Platen and Munters completed their project in 1922.

Enter Mr. Wenner-Gren

Nothing much was done about marketing their invention until A. L. Wenner-Gren, present chairman of the board of A. B. Elektrolux, came along. Mr. Wenner-Gren was the specialty salesman who started out by purchasing a hundred vacuum cleaners, and ended up by owning the company which manufactured them.

Sensing the possibilities inherent in a household refrigeration device (remember, this was the early 1920's, when the idea hadn't even caught on in the United States, let alone Europe or elsewhere) he experimented with the model, tested it.

In the autumn of 1924 he acquired sole rights to its manufacture, paying cash, shares in A. B. Elektrolux, and arranging for royalties.

Since that time he has built the business into one of the greatest institutions of Sweden, and easily the most international one. A. B. Elektrolux, with factories in Sweden, Germany, England, and France, produces and distributes the refrigerator all over the world, except in the Americas.

Manufacturing rights for North and South America are held by Servel, Inc., of New York City and Evansville. Mr. Wenner-Gren, however, has a large bloc of stock in this corporation, and keeps an active hand in the control.

Mr. Wenner-Gren is one of the leading citizens of Sweden. He is an adviser to the government, close to the crown, and prominent socially. His interests now are extended into a variety of enterprises.

Business vs. Politics

Mr. Faulkner, the managing director, is an Englishman. He came over to Sweden to join Electrolux as an accountant; and rose to become the chief of all operations of both the refrigerator and vacuum cleaner divisions.

He is a comparatively young man, as is Mr. Laurin; but has the gravity and composure of a much older man.

It's his experience that 90% of the time of an executive whose business is international must be devoted to finding ways and means of operating despite governmental restrictions. Not that Sweden makes it so tough to do business—but oh, boy!—what troubles they have in other countries in Europe!

Raw materials are more costly in Sweden than they are in the United States, he finds. Moreover, the rise and spread of economic nationalism in Europe makes for small markets. A manufacturer in Europe thus seldom is able to get production up to a point where prices can come down much.

Comparatively cool is the climate in Sweden, which has been no help to the development of the home market. That's been done by intense specialty salesmanship. But Mr. Faulkner doesn't feel that even the latter could create much of a demand for refrigerated air-conditioning equipment in Sweden. It's just too cold.

Cabinet construction need not be held to such strict standards in Sweden as elsewhere, however, because the low external temperatures put no heavy strain on the box.

90% Captured

Nils Laurin claims that Electrolux captures 90% of the household refrigeration sales in Sweden. This, despite the fact that American and German makes are sold there at competitive

prices. Sweden being a low-tariff country, the duty on foreign makes is only 10% of the invoice price.

In the larger cities Electrolux maintains its own branch operations. Elsewhere in Sweden are 120 dealers who sell and service. No consignment business is done.

Ironmongers, who happen to maintain big stores in Sweden, are the most numerous classification of dealers. Others are electrical shops and steamfitters.

Most Electrolux refrigerators in Sweden employ an electrical heating element; although some gas-fired jobs are used, depending on the relative rates quoted on the two varieties of power. Elsewhere in Europe about 17% of the Electrolux installations are gas jobs.

Absolutely no retail price-cutting is permitted, Mr. Laurin declares. Discounts just don't go in Sweden.

Sizes range from 1½ cu. ft. (the only size sold in Germany, and the most popular in Sweden and England) to 5 cu. ft. The smallest size box is sold chiefly to two-room apartments. Mr. Laurin feels that there is a real need among Swedish bachelors and couples living in a single room for a 1 cu. ft. box.

Electrolux is fortunate in having a mechanism readily adaptable to these extremely small sizes.

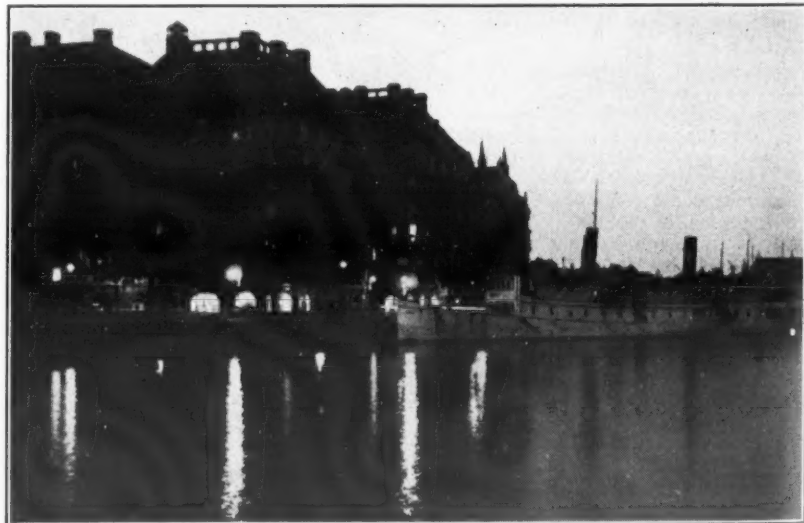
Motor-compressor systems do not find it economical to provide refrigeration for boxes of less than 2 or 2½-cu. ft. capacity.

'Wall Street'



Stockholm's "Wall Street" is the darkest portion of the city, and the most New Yorkish. Note Standard Oil sign at top of picture, and the light sky.

Twilight at Midnight



Swedish summers are heaven for sunlovers. It's bright daylight for at least 20 hours of the day, and twilight while the sun is down. The editor took the above snapshot in Stockholm at 12:45 a. m.

Stockholm is Safest City of All for Automobile Driving at Night



The combination of long hours of sunshine, brilliantly effective street lighting, and the two-level "traffic circus" idea for eliminating stop-street intersections, make Stockholm the world's safest metropolis for automobile drivers. First picture shows two "traffic circus" intersections seen through a windshield. (This photograph has been retouched to sharpen the outlines of auto's interior.)

Pittsburgh Show to Play Up Refrigeration & Conditioning

PITTSBURGH—Displays of air-conditioning and electric refrigeration firms will play a prominent part in Pittsburgh's Second Annual Home and Electric Show which opens here April 3 in Motor Square Garden.

The show, which will run nine days, is under the joint sponsorship of the Electric League of Pittsburgh and the Pittsburgh Builders' Exchange. Gerard H. Nickerson, Electric League manager, is general manager of the event.

- AIR CONDITIONING NEWS -

Railroads Extend Use Of Air Conditioning

(Concluded from Page 1, Column 1) Immediate steps in the air-conditioning program announced by some leading roads are:

By the Boston and Maine and its Maine Central; 55 additional de luxe air-conditioned coaches.

By Central of Georgia; last year's increase of ten percent (\$1,400,000) in gross earnings will be used for improvement of service, including air conditioning of all local and through trains.

By the Central Vermont—Additional buffet club coaches.

By Chicago Great Western—Conditioning of 15 coaches as a start.

By Rock Island—One new conditioned train on Chicago-Los Angeles run; six new conditioned streamlined trains on runs taking in Chicago, Kansas City, Minneapolis, St. Paul, Denver, Des Moines, and Peoria.

By Kansas City Southern—\$5,000,000 for new rolling stock, and air conditioning.

By Louisville & Nashville—\$1,000,000 for "improvements."

By M. K. & T.—29 new conditioned cars.

By New Haven—\$2,225,000 for conditioning 55 passenger coaches, and five cafeteria coaches.

By Chicago, Milwaukee, St. Paul, & Pacific—Court petitions to permit completion of payments on present conditioned cars as the alternative to losing them because "air-conditioned service is a modern necessity without which the debtor would lose from its passenger patronage an amount of money greatly in excess of payments required of it under the terms of the agreement."

By New York Central—Marked success of Mercury (N.Y.C. air-conditioned Detroit-Cleveland train) causes persistent reports that the road is planning sister trains for the Detroit-Cleveland, and the Cleveland-Cincinnati runs.

By Nickel Plate—Air conditioning 10 additional passenger coaches, and four dining cars.

By Northern Pacific—Will improve 29 passenger coaches.

By Reading—12 new conditioned passenger coaches.

By Seaboard Air Line—Six deluxe air-conditioned passenger coaches.

By Southern—132 sets of steam jet equipment.

By Southern Pacific—\$16,500,000 for streamlined locomotives and air-conditioned passenger coaches.

By Wabash—Air-conditioned tap-room dining cars.

By Western Pacific—Additional passenger coaches.

The ever-rising tide even bursts the bounds of the U.S.A., for:

B. & O. announcements feature air-conditioned tours to Mexico City, the land of the Aztecs.

The Grand Trunk and Canadian National Railways contemplate "much additional air conditioning."

Canadian Pacific will condition 136 more passenger coaches this year.

According to John J. Pelley, president of the Association of American Railroads, "Probably no innovation has won more favorable reaction from the public than the air conditioning of passenger cars."

Cleveland Steel Issues Booklet On Heating and Conditioning

CLEVELAND—How dealers can take advantage of the expanding market for oil heating and air conditioning is told in a new 24-page booklet published by Cleveland Steel Products Corp.

Entitled "How Far Will You Go?", the book contains such information as how to identify your place of business, how to find your market, how to obtain prospects, how to develop and keep the prospect's interest, steps that lead to closed sales.

Air Conditioning Seems Headed for Big Year In Philadelphia

PHILADELPHIA—Air conditioning here seems destined to enjoy a much greater expansion during 1937 even than during the past banner year 1936, as may be seen by the following partial tabulation made by the Philadelphia Electric Co., of various businesses known to be negotiating for air conditioning to be installed in the near future:

- 20 Theaters
- 2 Department Stores
- 2 Department Store Restaurants
- 11 Popular-Price Variety Stores
- 2 Office Buildings
- 2 Apartment Houses
- 9 Stores of Various Types
- 14 Restaurants
- 6 Private Office Suites

In addition to the above list of impending installations, are many doctors, dentists, funeral homes, barber shops, and beauty parlors which, according to the Philadelphia Electric Co., plan to air condition their quarters before summer for the benefit of their respective publics.

Examples of the "early birds" are:

Benny the Bum's Night Club

The Wilbur Rogers Woman's Specialty Shop

The Harold B. Mulligan Building

Benny the Bum's is conditioned by a central system located in the basement, the system distributing conditioned air through a duct system which was installed outside the building in order to avoid interference with, and alterations to, interior decorations. Air is introduced into the club space through inconspicuous wall outlets.

Summer cooling and dehumidification is accomplished by two 20-ton refrigerating units located adjacent to the central air-distributing equipment in the basement.

According to the management of Benny the Bum's, the new system already has proved itself a boon to business, even during the winter months because the smoke-and-odor-laden atmosphere continuously is replaced by clean, fresh outside air.

BUSINESS AS USUAL

In the Wilbur Rogers Woman's Specialty Shop, the simultaneous installation of air conditioning and extensive interior remodeling has been accomplished without suspension of, or interference with, "business as usual."

In this installation, air conditioning is accomplished by a central system with a 50-ton refrigerating unit located in unused basement space. The system is designed for all-year service.

In his previous funeral home, Harold B. Mulligan had found that the use of air conditioning not only resulted in increased comfort, but proved to be a money saver as well because of its tendency toward preservation of costly and perishable floral decorations. So convinced was Mr. Mulligan of the desirability of air conditioning in his business, that when he expanded his business into its new home, he decided to condition the entire building.

In this installation, the air condi-

tioning is accomplished by a central system, located in the basement and making use of a 20-ton refrigerating unit.

Auditorium Licensing Plan Described in Folder

NEW YORK CITY—The Auditorium licensing plan, and how it may be utilized by designers, builders, and buyers of air-conditioning equipment, is explained in a new folder issued by Auditorium Conditioning Corp.

Lederer Takes Over Rex Cole's Bridgeport Retail Store

BRIDGEPORT, Conn.—Joseph H. Lederer, Inc., local General Electric dealer, has taken over the local appliance store of Rex Cole, Inc. The two outlets will eventually be consolidated at the Main St. location of the former firm.

Recently completed alterations at the Lederer store have resulted in a new electric kitchen, and a sound-proof radio demonstration room.

C. C. W. Smith, former manager of the local Rex Cole store, is now sales manager of the Lederer company. He will supervise a staff of 20 persons, including Mary Volles, home economist.

Joseph H. Lederer is president of the company, which he founded three years ago. His brother, I. J. Lederer, is treasurer, and Julia M. Hudak is secretary.

3 Wilmington Frigidaire Salesmen Given Awards

WILMINGTON, Del.—Three members of the Frigidaire sales force of the Wilmington Auto Sales Co. here were given awards last week for sales excellence. They are W. J. Bredin, J. A. Hoodock and Royal C. Hull.

Speakers & Exhibits for Oil Burner Show Listed

(Concluded from Page 1, Column 1)

chairman, Carrier Corp.; Health Angles of Winter Conditioning—Dr. C. A. Mills, professor of experimental medicine, University of Cincinnati; Distillate Burner Group—M. F. Cotes presiding; Industrial Burner Group—E. P. Bailey presiding.

Wednesday, March 17—(Financial and accounting sessions): Elements of Cost in Oil Burner Manufacture—R. T. Moore, Mattison & Davey, members American Institute Accountants.

Marketing session: Oil Burner Marketing—J. W. Scott, president, Buckley & Scott Utilities, Inc., Boston; Relationship Legislation to Marketing—B. H. Markham; Second Air-Conditioning Lecture—Elliott Harrington, air-conditioning department, General Electric Co.

Thursday, March 18—(Dealers' Day): "Service and Installation Cost Control"—C. W. Whitney, president of ABC Oil Burner & Engineering Co., Inc., Philadelphia; "Modern Merchandising"—Dr. Herbert W. Hess, professor of merchandising, University of Pennsylvania; third speaker to be announced; annual banquet and dance.

Friday, March 19—Conference on regional meetings—speaker—W. J. Donald, secretary, National Electrical Manufacturers Association.

Other speakers: G. Harvey Porter, managing director, Oil Burner Institute; William F. Brannan, president, Oil Burner Institute; Third Air-Conditioning Lecture—J. K. Knighton, air-conditioning department, Nash-Kelvinator Corp.

EXHIBITORS

Exhibitors who will have displays of oil burners and accessories at the exposition include:

American Radiator Co., New York City; Anchor Post Fence Co., Baltimore; Automatic Products Co., Milwaukee; Auto-

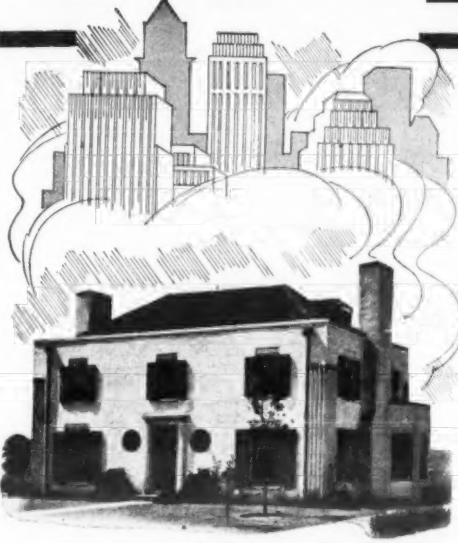
Heat Corp., New York City; Bell & Gossett Co., Chicago; Bethlehem Foundry & Machine Co., Bethlehem, Pa.; Burnham Boiler Corp., Irvington, N. Y.; Carter-Korth Oil Burner Corp., Roselle Park, N. J.; Century Engineering Corp., Cedar Rapids, Iowa; Cleveland Steel Products Corp., Cleveland; Delco Frigidaire Conditioning Corp., Dayton; Detroit Lubricator Co., Detroit; Dongan Electric Mfg. Co., Detroit; Electrol, Inc., Clifton, N. J.; Fitzgibbons Boiler Co., Inc., New York City.

Gar Wood Industries, Inc., Detroit; General Electric Co., Air Conditioning Dept., Bloomfield, N. J.; General Electric Co., Industrial Dept., Schenectady; General Fittings Co., Providence, R. I.; Gilbert & Barker Mfg. Co., Springfield, Mass.; Harvey Whipple Co., Springfield, Mass.; Jefferson Electric Co., Bellwood, Ill.; S. T. Johnson Co., Oakland, Calif.; The Kent Co., Inc., Rome, N. Y.; Kewanee Boiler Corp., Kewanee, Ill.; H. C. Little Burner Co., San Rafael, Calif.; Lynn Products Co., Lynn, Mass.; May Oil Burner Corp., Baltimore; McDonnell & Miller, Chicago.

The Mercoid Corp., Chicago; Minneapolis-Honeywell Regulator Co., Minneapolis; L. J. Mueller Furnace Co., Milwaukee; National Alroil Burner Corp., Philadelphia; National Air Conditioning, Inc., New York City; Nu-Way Corp., Rock Island, Ill.; Penn Electric Switch Co., Des Moines; Perflex Controls Co., Milwaukee; Petroleum Heat & Power Co., Stamford, Conn.; Preferred Utilities Mfg. Corp., New York City; Reif-Rexoil, Inc., Buffalo; Rochester Mfg. Co., Inc., Rochester, N. Y.; Shell Eastern Petroleum Products, Inc., New York City; Socony Vacuum Oil Co., New York City; Sundstrand Machine Tool Co., Rockford, Ill.

Synco-Flame Burner Corp., Hartford, Conn.; Taco Heaters, Inc., New York City; H. A. Thrush & Co., Peru, Ind.; Timken Silent Automatic Co., Detroit; Titusville Iron Works Co., Titusville, Pa.; The Torrington Mfg. Co., Inc., Torrington, Conn.; Tutill Pump Co., Chicago; United Electric Controls Co., Boston; Viking Pump Co., Cedar Falls, Iowa; The Vinco Co., Inc., New York City; Wayne Oil Burner Corp., Fort Wayne, Ind.; Webster Electric Co., Racine, Wis.; Weil McLain Co., Chicago; York Oil Burner Co., Inc., York, Pa.; Waterfilm Boilers, Inc., Jersey City, N. J.; Ballard Oil Burner Div., Gilbert & Barker Mfg. Co., Springfield, Mass.; Refractory & Insulation Corp., New York City; Utica Radiator Corp., Utica, N. Y.; U. S. Radiator Corp., Detroit.

Field+Factory Engineering- THAT TAKES THE DOUBT OUT OF AIR CONDITIONING



The Kelvinator Research Residence, built in 1935, and other extensive air conditioning laboratories maintained by Kelvinator, are showing the way to more profitable air conditioning methods for residential and commercial application. Here, opinions give place to facts, arbitrary formulae are replaced by scientific data, uncertain factors at last are being measured.

Kelvinator distributors are kept up-to-date on the findings of all Kelvinator air conditioning research, enabling them to advise soundly on air conditioning for every purpose.



"Local invention" has given place to exact science in the application of air conditioning equipment! Kelvinator engineering, which pioneered in the development of commercial and domestic cooling equipment, and introduced a most complete line of factory-built air conditioning units, now presents a comprehensive program of research-tested application methods. With this engineering support, even the new Kelvinator distributors being franchised this year can render the same reliable service as experienced factory engineers. Mail the coupon for details.

Kelvinator

Air Conditioning

PLUS-POWERED FOR ECONOMY



KELVINATOR DIVISION OF NASH-KELVINATOR CORPORATION
DETROIT, MICHIGAN

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Address _____

City and State _____

ACR-3

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AIR CONDITIONING AND REFRIGERATION NEWS

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F. O. JORDAN, Air Conditioning
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Advertising Representatives:

John B. Gallagher Co., Inc.,
11 W. 42nd St., New York, N. Y.
Pennsylvania 6-1380

Lewis & Noelle
612 N. Michigan Ave., Chicago, Ill.
Superior 8550

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MARCH 10, 1937

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Exit Sales Contests

SALES CONTESTS are out this year, as far as the major manufacturers of household electric refrigerators are concerned. They have no objections to their distributor or dealer organizations conducting them; they merely have decided to sponsor none on a national scale.

In making this decision, the manufacturers have no objection toward the sales contest as such. They recognize its value and importance. The point is that contests have been subjected to abuses which almost place them in the racket class.

These abuses, the reputable manufacturers believe, outweigh the undeniably worthy results of the contests.

Raids on Dealer Bodies

In the first place, it seems that contests were occasionally used for raids on the dealer bodies of other manufacturers. A field man would approach an excellent dealer who was then handling the product of a competing manufacturer and say to him:

"Look. If you will cancel your Maybecold franchise, and come in with us under the Frostycos banner, I'll give you a trip to China and a couple of gold watches."

"How can you do that?" the wary dealer would ask.

"Simple. We're running a Shoot-for-Par contest through April. A trip to China is the grand prize in each district, with gold watches offered for the leading salesman. You join us exclusively, and I'll fix up the credits so that you win in your district."

Hearing of this offer, another field man might come around and offer three gold watches, a trip to Zanzibar, and a hundred dollars cash, also under the guise of a contest. And so up the ante would go.

Naturally this sort of thing has no excuse, and manufacturers were entirely right in eliminating all chance for outrages of this type to be perpetrated.

Still Fundamental Practice

Nevertheless, the sales contest is still a fundamental part of the specialty selling formula, and there are many reasons why distributors and dealers—who operate in limited territories and only within their own organizations—should continue the practice in their own right.

As a matter of fact, "Ham" Campbell, who was for many years Rex Cole's sales promotion manager (he recently went into the moving picture business), has put himself on record as believing that the purely local contest invariably arouses a higher pitch of enthusiasm—and more tangible results—than one of nation-wide proportions.

A sales contest provides incentive for salesmen to make more calls, turn up more prospects, spend more time on the job, and close more sales. True, reaction often sets in right after a contest, and dull periods sometimes follow; but experience shows that the reaction seldom falls as low as the contest results run high.

Keeps Salesman Sold

Best of all, the sales contest keeps the salesman interested in and sold on his job. Right now we are coming into a seller's market for labor. Competition for men is becoming keener all the time. The reverse has been true during the last few years, when the refrigeration industry has profited by the large number of able men it could attract to its selling forces by the mere fact that the business was going ahead while others were lagging behind.

The specialty salesman is a lone wolf. He works on commission, and owes allegiance to no one but himself. If the pastures look greener elsewhere, or if his present job begins to bore him, he has little hesitation in jumping the fence. He is not like the wage or salary earner who may be apt to think a long time before abandoning his regular pay envelope for something new and unknown. To the specialty salesman it is merely a matter of trading one uncertainty for a newer and possibly more exciting uncertainty.

Responds to Sporting Appeal

This type of man responds to the contest appeal. Sporting blood runs through his arteries. He likes a fight, a challenge, a game. He would rather play than work, and loves his work most when it is made to resemble play. Having a highly developed ego, he likes to win, enjoys recognition and the spotlight. All of these things are provided by the contest.

Experienced sales directors have found that the rewards are not always so important as the manner in which the contest is staged. Extravagant prizes too often lead to abuses and to bitterness. The game's the thing in a contest.

Theme of Current Interest

It should be based on a theme of current interest. Baseball in the spring, elections in the fall of campaign years, the stock market during boom times, prize fights just before a Battle of the Century—these are stock themes which never fail to pull. The more timely the theme, the simpler it is to arouse and sustain interest.

Timeliness also aids in the showmanship and staging of the contest, two factors which are so important to its success. For example, during a local primary election campaign, contestants can impersonate rival candidates, using their placards and buttons. All the newspaper publicity attendant to the primary serves to whet the salesmen's interest in their own race.

Tips on Contest Staging

Speaking of races, before the running of a big turf event like the Santa Anita Handicap, or the Kentucky Derby, contestants can take the names of horses entered, wear the colors (inconspicuously, as in a buttonhole) of the stables represented, and otherwise participate in the general tide of interest in the race itself.

Real-life "props" displayed conspicuously around headquarters are always a means of maintaining interest, and may be borrowed from promoters of the event from which the theme is taken.

Mimeographed bulletins containing pep talks and humorous chit-chat about the progress of the race can be distributed, a blackboard or chart with the standings of the contestants posted daily is by all means an essential, and parties or meetings with the contest as a theme may be worked out.

Attendance at night sales meetings surely can be stimulated when a contest is involved.

Tying in the Company

Everything the company does should partake of the contest's flavor; all its tools of business, from stationery to trucks; should be decorated in the contest motif.

Magnification should be the rule in the decorations and attendant showmanship, just as the scoring system should deal in thousands of points, rather than tens or hundreds. Salesmen like to think and deal in large terms.

Meet the Wife

Bringing the wife and family of the salesman into the picture is always a help, and at no time is this easier than during a contest. Such times give the salesman a better excuse for working nights (especially if merchandise prizes be something for the home); and at the social functions attendant to the contest, the wives may be invited.

Contests also provide opportunity for "human interest" photographs and stories, which can be submitted to local newspapers, manufacturers' house organs, and trade papers. Publication of these adds new pride to the salesman's appreciation of his job.

Fraternizing with Salesmen

The entire staff can be feted at a victory celebration, when the prizes are awarded. Thus a special reason is afforded the management to fraternize with the salesmen, congratulate them, and make them feel that they are an important part of the organization.

Users can be cultivated by winning salesmen, and thanked for helping them capture a prize. Hence good will is built, for the customers will take pride in learning that their purchase was instrumental in aiding another to achieve recognition, and will assume more of a personal interest in an organization which might otherwise not be able easily to display its "human side" to them.

Local Contests Invaluable

So many arguments can be advanced for the local sales contest that one soon runs out of time and space. For details on the actual running of a contest, readers may consult their files of back issues of the NEWS, write the home office, or make use of the services offered by specialists in that line.

With the coming of spring, and the hot competition both for business and for salesmen, distributors and dealers may find in the sales contest a strong ally.

- LETTERS -

Questions Canadian Sales Figures

Kelvinator of Canada, Ltd.
London, Ont., Canada

Editor:

On page 16 of your Feb. 24 issue, you have reprinted a copy of a letter received from us and your reply, all of which bears on your figures published in Feb. 3 issue, "Canadian sales for 1936."

The statement in the last paragraph of your reply, to the effect that the published figure is the total quantity of domestic refrigerators reported by members of Nema as exported to Canada in 1936, is not true. The Nema figures not only include exports from the United States, but sales figures of certain Canadian subsidiaries of Nema members, which refrigerators may or may not have been manufactured in Canada.

We would suggest that you refer to the United States Department of Commerce for the actual figures on exports from the United States to Canada of all makes of refrigerators. The Department of Commerce figures have been published in your paper from time to time.

R. L. C. KEITH, Comptroller.

The Last Frontier

620 North Michigan Ave.
Chicago, Ill.

March 3, 1937.

Editor:

Some time ago I had the good fortune to read some articles by you in your magazine in which you referred to the opportunities prevalent in Australia and the Hawaiian Islands.

I was intensely interested, as I am casting about for a more favorable place in which to live.

My field is architecture, although I now do both community planning and residential construction, and I have my own practice.

I would like to have a talk with you if you have occasion to come to Chicago in the near future. Or, failing that, I might come to Detroit this month or next. If I do, may I impose upon your better nature by taking a bit of your time.

The enigma in my position is that of knowing enough about other places to know just what spots to consider as possible new locations.

ALBERT CRIZ.

Answer: It is true that exceptionally good opportunities do exist for a young man in Hawaii, Australia, and New Zealand as well. But it is not to be assumed that just anyone can go to one of these places and make good right away, or be happy.

Australia and New Zealand, especially, are still in the development stage. The same qualities which went into the make-up of the American pioneers are prerequisites for the man who would go to the Antipodes in search of his fortune.

He must be rugged, he must have both energy and patience, and he should have a well-developed streak of imagination. His opportunity will be largely what he makes it, what he finds after he gets there. No beds of roses, these; nor is the life apt to be so comfortable as it is in the United States.

But for the pioneering type of person, Australia and New Zealand comprise the Last Frontier.

EDITOR.

New Zealander Wants the Red Book

The Dunedin Ice Cream Mfg. Co., Ltd.
Ward St., Dunedin, C. 1 (New Zealand)
Manufacturers, Royal Ice Cream and "Royalties"

Editor:

Having had the pleasure of receiving the REFRIGERATION NEWS and having gained considerable knowledge I would esteem it a favor if you would send me a copy of the Master Catalog of Air Conditioning and Refrigeration ("The Red Book"). I would also be glad if you would have my name placed on some of the manufacturers catalog mailing lists.

With reference to the REFRIGERATION NEWS I find the articles very interesting and instructive as we lack information of this sort in New Zealand. V. STOKES, Servicing Engineer.

Seeks Small Dehumidifier

Chester E. Rahr
100 East 42nd St., New York City
Feb. 28, 1937.

Editor:

May we inquire if, to your knowledge, there is any small unit (shall we say residence size) used in dehumidifying, that is operated on any other system than that of refrigeration?

We would also be interested to learn as to who in the industry is manufacturing and distributing in the greatest volume, units that can be used for summer and for winter.

BEATRICE K. WILLIAMS,
Secretary to Mr. Rahr.

Answer: The Williams Oil-O-Matic Heating Corp. of Bloomington, Ill., make a residential air-cooling and dehumidifying unit which operates on the "absorption" cycle instead of the conventional compressive refrigeration cycle. This unit burns ordinary fuel oil.

If you are interested in dehumidification only, Silica Gel may be used, and afterward may be regenerated by oil heat.

The majority of the concerns in the air-conditioning business make residential units which will cool and dehumidify through the use of cold well water (if available) in place of refrigeration.

Manufacturer from Australia Coming

E. Hallstrom
Refrigerator Manufacturer
Kerosene Operated
462-464 Willoughby Rd., Willoughby
Sydney, Australia
Feb. 8, 1937.

Mr. Taubeneck:

I shall leave Sydney by the M.V. Aorangi on 18th this month and shall arrive at Vancouver (B. C.) on 12th March, where my mail address will be C/-Canadian Bank of Commerce. Thereafter my proposed itinerary is:

Depart Vancouver 5 p. m., March 12.
Arrive Banff 5 p. m., March 13.
Depart Banff 5 p. m., March 15.
Arrive Chicago March 17.

At Chicago my postal address will be C/-First National Bank of Chicago. My visit is, of course, in connection with my business interests here and particularly to contact manufacturers of non-electric refrigeration apparatus and other kindred lines which may be suitable for merchandising in Australia.

I shall greatly appreciate any help you may be able to afford me both in connection with establishing contact and with a reasonable degree of publicity.

E. HALLSTROM.

Editor's Note: Mr. Hallstrom's kerosene-operated absorption type refrigerators outsell any other household refrigerator in Australia, including electric, gas, and ice types. The editor visited his factory while in Sydney a year ago.

Modine, Not Moline

The Cramer-Krasselt Co.
Milwaukee, Wis.

March 5, 1937.

Editor:

In the Feb. 24 issue of REFRIGERATION NEWS, you published a story in regards to the purchase of the Synco-matic Corp. by our client, the Modine Mfg. Co. of Racine, Wis. However, in this news release, you called our client, the "Moline Mfg. Co." To say that this disturbed the management of the Modine Mfg. Co. is putting it mildly. Please, on any future news releases, refer to them by their proper name.

T. L. HASBROUCK,
Service Manager.

Surprised?

1019 Woodview Road
Cleveland Heights, Ohio

Jan. 8, 1937.

Dear Sirs:

Received my copy of your SPECIFICATIONS book and was a bit surprised in finding such a fine and helpful book.

Also have subscribed to REFRIGERATION NEWS, which I have read for some time.

Could I be placed on your Catalog Mailing List?

I have recently graduated from R.E.I. of Youngstown, Ohio, and hope to start in business soon.

JAMES ROGERS.

Favors Red Book Plan

Jerry Dimick Co.
Refrigeration Equipment, Automatic Controls
436 S. E. Sixth St., Portland, Ore.

Jan. 26, 1937.

Gentlemen:

Please include my name in your mailing list under manufacturer's representatives for the Pacific Northwest.

I am greatly interested in The Red Book. It certainly is a step in the right direction for bringing together the manufacturer and the distributor. I hope my request for an early copy is not too far down the list.

JERRY DIMICK.

Small Homes Forum Plans Campaign to Meet 'Shortage'

NEW YORK CITY—As the initial step in a national program "to meet the estimated shortage of 1,000,000 small homes in America," representatives of more than 50 trade associations in the residential building, furnishing, and equipment fields took part last week in a small homes forum in Hotel Roosevelt, under auspices of the Sales Executives Club of New York.

With the approval of Federal Housing Administration, officials of the National Lumber Manufacturers Association and cooperating agencies announced plans to erect more than 4,000 demonstration dwellings in some 2,000 communities, to show the feasibility of building modern homes "for the masses."

Sponsors of the movement include National Retail Dry Goods Association, National Lumber Dealers Association, National Electrical Manufacturers Association, and allied organizations.

Bruce A. Wilson, FHA educational director, told the forum there was a "crying need for houses the masses can buy," and that, to meet 70% of the potential demand, the cost must be below \$5,000.

Dr. Wilson, secretary-manager of National Lumber Manufacturers Association, declared that the demonstration program's purpose was to show how dwellings costing from \$2,500 up could be built according to FHA specifications. The promotional campaign, he stressed, was "not intended to compete with builders, but to stir them up," and to open up the low price market for them.

Cameron Heads Dept. Store Sales for G-E

CLEVELAND—Ralph C. Cameron has been appointed manager of the department store sales division of the General Electric appliance and merchandise department. In his new capacity he will coordinate all sales and promotional activities directly affecting department stores, it has been announced by P. B. Zimmerman, general manager of the company's appliance sales.

Mr. Cameron also will assist sales divisions and distributors in effecting contracts with chain and independent department and furniture stores. For some years he has been in charge of department store activities for the specialty appliance line, with headquarters in Cleveland.

Announced at the same time by Mr. Zimmerman was the appointment of John P. Rainbault as manager of the electric clock section of the appliance and merchandise department; the appointment of A. E. Pierce as sales manager of the electric clock section; and the appointment of C. M. Wilson as sales manager of the radio sales division. E. H. Vogel recently was made manager of the latter division.

4,501 Electric Ranges Sold in St. Louis Area in 1936

ST. LOUIS—A total of 4,501 electric ranges were sold and installed during 1936 in the territory served by Union Electric Light & Power Co., local utility. This compares with about 2,300 electric ranges sold in 1935.

Retail value of 1936 range sales was \$500,000. Installation of these ranges provided \$200,000 worth of business for electrical contractors.

Salesmen who sold two or more ranges during 1936 were given a dinner at the Hotel Jefferson by the merchandising division of the utility. Plans for another electric range sales contest are now being developed by the power company.

Chicago Service Firm To Sell Norge Line

CHICAGO—American Refrigerating Engineers, Inc., local sales and service organization, has taken on the entire Norge line of household appliances. Simultaneously, the company appointed William Witt, veteran local Norge executive, as sales manager.

American Refrigerating Engineers, Inc., was well up among the leaders in refrigerator sales by dealers in this territory last year, company executives claim.

S. J. Molner, vice president, reports that the firm grossed over \$50,000 last year in household service alone, and that almost an equal amount of commercial service work was done.

Some service orders, Mr. Molner declares, have been received from points as far distant as the Orient in response to classified advertisements inserted regularly in Air Conditioning and Refrigeration News.

Grunow Honored at Kansas City Dealers Luncheon

KANSAS CITY—Wm. C. Grunow, president of General Household Utilities Co., J. J. Davin, assistant to the president, and Dr. J. D. Jordan, physicist-scientist and engineer of the company, attended a special dealer luncheon given to Mr. Grunow by his new refrigeration distributor, McNeil-Likens, here. McNeil and Likens have sold Grunow products for 15 years.

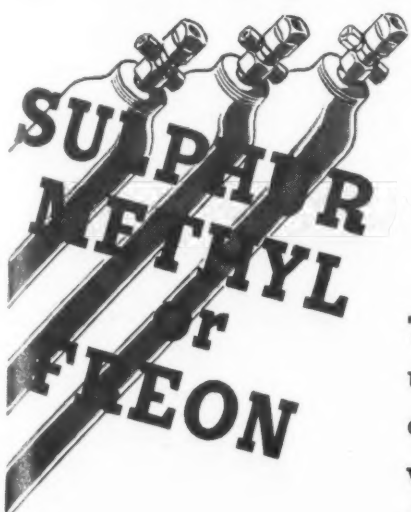
Bollman Joins Hays MacFarland Advertising Agency

CHICAGO—Fred K. Bollman, formerly with Erwin Wasey Co. in charge of Philco advertising, and more recently with the Blackett-Sample-Hummert agency in charge of advertising for Stewart-Warner Corp., has accepted a position as account executive with Hays MacFarland & Co.

G-E Names Sioux City Dealer

SIoux CITY, Iowa—Household Appliance Co. here has been appointed by the General Electric Supply Corp. as dealer in refrigerators and other appliances.

TEMPRITE



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on

The Temprite line includes units which operate with equal effectiveness with any of the well-known refrigerants—sulphur dioxide, methyl chloride or "Freon 12."

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TEMPRITE PRODUCTS CORPORATION

1349 East Milwaukee Ave., Detroit, Michigan

ORIGINATORS OF INSTANTANEOUS LIQUID COOLING DEVICES



BUSINESS OPPORTUNITY

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... But maybe Not tomorrow!



FAIRBANKS-MORSE ORTHO-CLIME UNIT ROOM COOLER

- No piping—no water connections.
- Cooling capacity—10,000 B. T. U.'s per hour, which is a cooling effect equivalent to 1665 pounds of ice per day.
- For rooms in homes, hotels, stores, hospitals, etc.

The Fairbanks-Morse line also includes central station plants, each engineered for the size of the job it is to do. Each provides complete 6-point air conditioning: cooling and dehumidifying in summer; heating and humidifying in winter; circulating and cleansing all year.

IF YOU want to get into the air conditioning business, act now. Tomorrow may be too late. Good franchises are being snapped up fast.

SOMEONE WILL SELL YOUR CUSTOMERS UNIT ROOM AIR CONDITIONERS— WHY NOT YOU?

The contacts you have established in the refrigerator business are prospects for this Fairbanks-Morse Room Air Conditioning Unit. You don't have to create an engineering staff to handle it. You add little or nothing to your present sales and service expense. There are no ducts to build. No pipes. No water connection. No engineering problem for you to solve. Just back it up to a window, plug it into the proper light circuit, and snap on the switch.

GIVES YOU THE EDGE ON COMPETITION

The Fairbanks-Morse Room Air Conditioning Unit offers more cooling capacity per dollar than other similar units. It provides complete summer air conditioning. It cools, dehumidifies, cleans and circulates air. Entire mechanism is enclosed in an all-metal cabinet handsomely finished in hand-rubbed American walnut. Its operation is quiet. You can hardly hear it run.

Backed by Fairbanks-Morse and 107 years of experience in adapting scientific principles to practical application.

A 3c STAMP WILL BRING DETAILS

Get complete information on what may be the best profit opportunity ever offered you. You can be the judge of that when you get the details. Write for Bulletin 3831. Address Fairbanks, Morse & Co., 900 South Wabash Avenue, Chicago, Illinois.

FAIRBANKS-MORSE ORTHO-CLIME

AIR CONDITIONING EQUIPMENT



For the Air-Conditioning Distributor-Contractor

This is No. 7 in the series, "How to Select and Install Air-Conditioning Systems" by T. H. Mabley, chief engineer for a Detroit air-conditioning distributor.

Drawing on his experience with this and other contracting firms Mr. Mabley outlines the procedure in selecting and installing equipment for specific applications, and discusses any special features of the job.

Previous articles in this series have been published as follows:

Case No. 1, A Single Office (Jan. 6); No. 2, A Conference Room (Jan. 13); No. 3, Residence System with Room Cabinets (Jan. 20); No. 4, Typical Commercial Application—A Shoe Store (Feb. 3); and No. 5, A Beauty Parlor (Feb. 3); No. 5, A Beauty Parlor (Feb. 24); and No. 6, A Coffee Shop (March 3).

HOW TO SELECT AND INSTALL AIR-CONDITIONING SYSTEMS

By T. H. Mabley, Chief Engineer,
Mechanical Heat & Cold, Inc., Detroit

Case No. 7

A Process Job

All previous applications discussed in this series were concerned with control of the air for the comfort of the occupants. In this case we will consider a process air-conditioning application.

Process jobs do not differ in principle from the comfort air-conditioning applications that we have been considering, but process air conditioning often covers a wider range of conditioning requirements and is more exacting in maintaining limits.

In comfort conditioning, the range of inside performance conditions is usually limited to 70 to 85° dry bulb, while many special industrial applications call for temperatures varying from zero to 140° F.

sensible heat load will be necessary to assure that the dehumidification takes place at the proper rate to give a 40% relative humidity in the room. This may be accomplished by so-called "reheating."

We shall be concerned also with the functions of filtering and air circulation, but only as secondary features.

In selecting outside design conditions the maximum conditions are used for a design basis in place of the average of the extreme temperatures as in the case of comfort conditioning, because it is necessary to maintain the prescribed inside temperature and humidity conditions irrespective of outside conditions, while in comfort-conditioning work there is some latitude for extremely high outside temperatures.

For this reason 100° dry bulb and 75° wet bulb are selected as a maxi-

conditioning system. A check of the dewpoint of the room with the data on condensation with -10° outdoor air will readily indicate the need for this precaution.

Due to the fact that the building is heated to a minimum of 50° at all times a temperature difference of 20° can be taken for the partitions during the winter. Since it is also true that the surrounding space is as warm as the outside in summer, a 30° differential for the wall, floor, and ceiling was used in the heat-gain tabulation.

It may also be noted that a slight change was made in the proportions of latent and sensible heat for the occupancy load because of the lower room temperature.

ADDITION OF MOISTURE

From information relative to the process we are able to derive a maximum figure for the amount of moisture thrown into the conditioned space by the work carried on in the room. This load represents a large proportion of the latent heat gain and so decreases the ratio of sensible to latent heat that anyone familiar with such a problem would immediately conclude that some arrangement for reheat was necessary. This point is shown also as soon as we start selecting equipment.

The most efficient conditioner to give the particular performance desired will have to handle 5,000 c.f.m. which is of course a fairly large amount of air for the space under consideration, but is necessary for satisfaction under maximum conditions indicated in our heat-gain calculations.

With this amount of air we have an inlet mixed air condition (recirculated and fresh air) of 71½° dry bulb and about 46 grains of moisture content per pound of air.

In order to get the proper dehumidification of this air to handle the total latent load, 10 grains of moisture must be removed from every pound of air and with a 30° refrigerant temperature in the cooling coils this can be accomplished by cooling the air to approximately 48° dry bulb outlet temperature.

REHEATING NEEDED

However, this temperature is lower than necessary to meet the expected sensible heat gain so that after the air has been cooled it must be reheated to approximately 63°. This amounts to the same thing as increasing the sensible heat load to obtain the right ratio of sensible to latent heat in the total cooling load.

This performance may be readily visualized by reference to any psychrometric chart and even plotting the conditions on the chart. The calculations will not be discussed in detail at this point, but can be readily carried out by using the figures for maximum latent and sensible heat shown on the load calculations together with the volume of air handled and the known inlet conditions.

In selecting a compressor to handle this particular application we must add to the cooling load computed for the room the additional figure of sensible heat from the reheat coil. In other words, the compressor selection must be based upon the total sensible and latent work done by the cooling and dehumidifying coil, rather than only the load as computed for the room.

This amounts to 5,000 c.f.m. x 15° x 1.03 or approximately 77,200 B.t.u. This means that the cooling machine must have a minimum capacity of 152,180 B.t.u. at 28° refrigerant temperature. It might also be noted that the heating coil will have to be sized to handle 77,200 B.t.u. with a 48° inlet temperature as well as having a capacity to handle the normal heating load of 46,422 B.t.u. when the

Heat Loss and Heat Gain Calculations

Heat Loss

Conduction	B.t.u.'s
Windows—75 sq. ft. x .45 x 80°	2,700
Outside Walls—(224—75) sq. ft. x .36 x 80°	4,290
Inside Partitions—704 sq. ft. x .30 x 20°	4,224
Ceiling—840 sq. ft. x .16 x 20°	2,688
Floor—840 sq. ft. x .30 x 20°	5,040
Fresh Air—Normal infiltration (1½ air changes) is 165 c.f.m. while required ventilation is 25 c.f.m. per person or 250 c.f.m. for the 10 occupants. Sensible Heat—250 c.f.m. x 1.03 x 80°	20,600
Heat for Humidification—250 c.f.m. x 43 grains x .64	6,880
Total Heat Loss	46,422

Heat Gain

Sensible Heat

Conduction:	B.t.u.
Windows—75 sq. ft. x .45 x 30°	1,012
Outside Walls—(224—75) sq. ft. x .36 x 30°	1,610
Inside Partitions—704 sq. ft. x .30 x 30°	6,336
Ceiling—840 sq. ft. x .16 x 30°	4,032
Floor—840 sq. ft. x .30 x 30°	7,560
Fresh Air—250 c.f.m. x 1.03 x 30°	7,725
Occupancy—10 people x 240 B.t.u.	2,400
Lights—800 watts x 3.4 B.t.u.	2,720
Motors—3 hp. x 3,500 B.t.u.	10,500
Total Sensible Heat	43,895

Latent Heat

Occupancy—10 people x 160 B.t.u.	1,600
Fresh Air—250 c.f.m. x (96—43) grains x .64	8,486
Appliances—20 lbs. of steam per hour x 1,050 B.t.u.	21,000
Total Latent Heat	31,086
Total Heat Gain	74,981
Ratio Sensible/Total Heat	.586

air inlet is 68° during the heating cycle.

Considerable allowance should be allowed in the selection of equipment for this kind of a job for varying loads and a factor of safety should be added to all the calculated figures mentioned before final choice of the units is made.

The air conditioner thus selected can now be installed as shown in Figs. 1 and 2. The supply grille will have to be designed to handle this large volume of air and should be equipped with deflecting vanes and volume control so as to assure the proper distribution of air.

Recirculation grilles are located at the points where the greatest variation in load conditions may be expected. This arrangement allows a quicker response to changes in room conditions.

CONTROL SYSTEM

The air conditioner will be controlled by two thermostats and two humidistats. Each of these instruments are set for either the high or the low limits desired. The high-limit thermostat and the high-limit humidistat will both control the cooling machine while the low-limit thermostat operates a steam valve, and face and by-pass dampers on the heating coil. The low-limit humidistat operates a solenoid valve on the humidifier.

These four controls have a positive control over the conditions in the room. If the temperature or humidity should tend to rise the cooling machine is started and this reduces both the temperature and the humidity. If before the humidity is properly reduced the temperature of the room is cooled below the low-limit thermostat setting, the heating coil is called into action to maintain the desired temperature by reheating the air until the high-limit humidistat is satisfied and shuts off the cooling cycle and the reheating becomes un-

necessary. The low-limit humidistat will operate the humidifier any time the humidity in the room drops below that desired.

In addition to the above the conditioner will circulate and filter the air so that we now may call this system a "complete" air-conditioning job inasmuch as it performs all the functions of air conditioning under some definite control.

Airtemp Opens Branch Of New Construction Corp. in Detroit

DETROIT—Establishment here of the first branch of Airtemp Construction Corp., newly formed subsidiary of Airtemp, Inc., has been announced by Colonel A. C. Downey, Airtemp president.

H. B. Orr, formerly with Airtemp, Inc., in Dayton, has been named general manager of the Detroit branch.

Airtemp Construction Corp. will function as a completely self-contained organization, according to Colonel Downey, and will handle all types of Airtemp conditioning equipment for residential and commercial installation.

Offices of the new Airtemp subsidiary have been established at 4841 Woodward Ave., formerly the location of Conditioned Air Corp.



FAN-E-FEX

The Forced Draft Unit cooler suitable for a wide variety of applications.

Compact design eliminates construction of costly space-wasting bunkers and baffles in storage rooms.

Temperature uniformity, controlled humidity, eliminating of sweating of walls and ceilings, and maintenance of sanitary conditions in storage rooms are distinct advantages of Fan-E-Fex forced draft circulation.

Fan-E-Fex will be supplied for use with any refrigerant specified.

REFRIGERATION APPLIANCES, INC.

FIN COILS, UNIT COOLERS
AIR CONDITIONING UNITS

923 WEST LAKE STREET • CHICAGO

Figs. 1 and 2—Air Conditioner in a Process Room

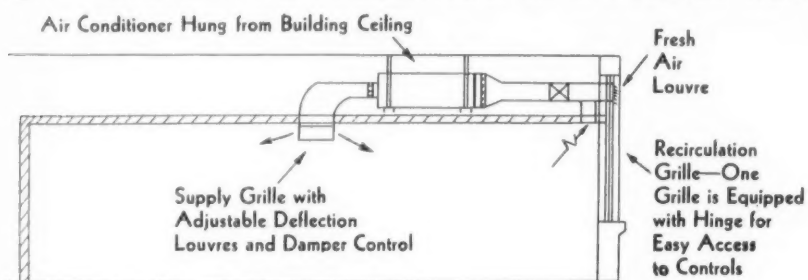


Fig. 1—View of installation looking through the wall of the room.

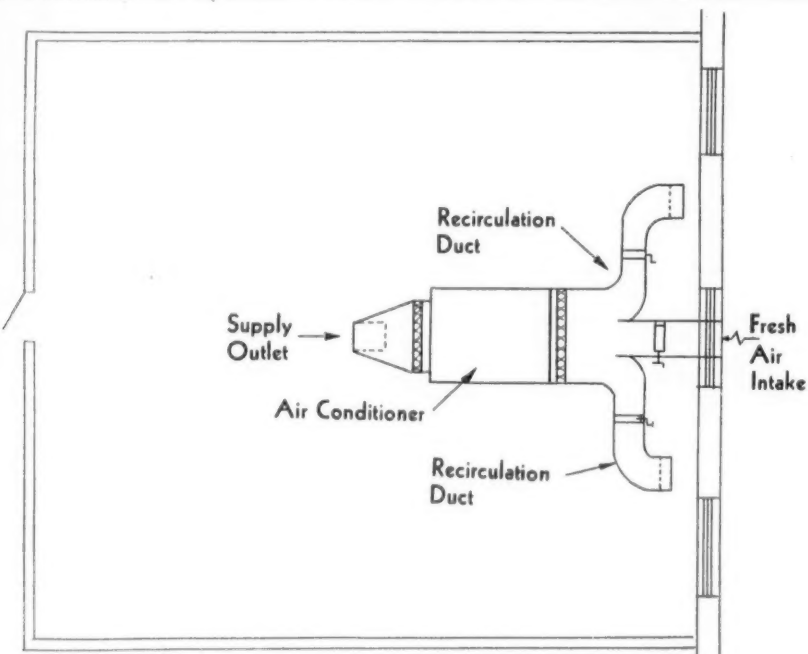


Fig. 2—Drawing of installation looking down on the room.

Also a certain fixed temperature is sometimes required and must be kept within a limit variation of one or two degrees regardless of outside conditions. This performance usually means considerable care must be taken in the selection and installation of equipment, but the steps taken are precisely the same as for any other type of system.

In this particular case we are working on a special process room in which it is desired that air conditions favorable to the process be maintained. It is important that these conditions be held during the entire year regardless of outside changes or possible variation of the load from within the room.

It has been determined that 70° dry bulb and 40% relative humidity is the most desirable condition for the work that is being carried on in the room. To keep the room at this condition, it will be necessary to control both temperature and humidity.

In the winter it will be necessary to heat and humidify the air, while in the summer it will be necessary to cool the air, and along with the cooling process dehumidification will take place.

In order that dehumidification may be controlled, some variation of the

mum outside condition in this particular area. Furthermore -10° dry bulb is chosen for the low limit of outdoor temperature. With this information we can proceed with the load calculations.

The room to be conditioned is practically a room within a room with the exception of the outside wall. The room is located on an intermediate floor of a factory building and is so located as to have a shaded exposure.

Partitions are tile and the floor is not insulated other than the furred ceiling below. The ceiling of the room which is dropped to the desired height is of wall board with a thin layer of loose insulation placed on top.

As soon as the inside conditions were specified it became apparent that double glazed windows would be necessary to eliminate the danger of condensation. These are to be installed at the same time as the



RENEWABLE SEAT

Here is an Automatic Expansion Valve with remarkably long life... one you can install and forget. Fast-moving gases simply cannot score or pit it. The non-metallic, corrosion-proof poppet and seat require little or no servicing... are readily renewed when necessary, at little cost, by the service man. This poppet construction and other exclusive features of design make the Sylphon Valve your logical choice. Ask for Bulletin O-5000.

FULTON SYLPHON COMPANY
Refrigeration Division
KNOXVILLE TENNESSEE

Sylphon

AUTOMATIC EXPANSION VALVE

Installation of Air Conditioning in Pittsburgh's Nixon Night Club Ends Usual Summer Business Shut-Off

PITTSBURGH—The Nixon Restaurant and Night Club, located in the basement of the Nixon Theatre here, no longer finds its season of activity cut short arbitrarily by the weather man, during the midsummer months from June to Labor Day.

Today, by reason of the recent installation of air-conditioning equipment, this well known establishment is able to remain open and attract patrons the year round, thus meeting, with the aid of modern scientifically cooled air, the competition of road houses which in the past have drawn the sweltering city crowds to the open country during the hot months.

The air-conditioning system at the Nixon Restaurant, which was installed by the Pittsburgh division of the York Ice Machinery Corp., involved some unusual problems in engineering and installation of equipment, due to the unusually low ceiling heights in the establishment.

This ceiling height, or "head-room" in engineering parlance, varied from 11 feet in the bar-room section of the restaurant to 7 feet 8 inches in the dining room and dance floor area.

These low ceilings were necessary in order to conceal steam pipes and ventilating ducts which served the theatre, overhead, thereby reducing the normal ceiling heights in the bar, dining room and dance floor areas by approximately 3 feet.

In meeting this problem, engineers first made a thorough preliminary survey of conditions to be met, in order to install air-conditioning equipment which would provide adequate circulation and distribution of fresh air at all times in an area which had a maximum capacity of 450 people.

This, it was decided, would require

a system of air distribution which would provide 4,500 c.f.m. of fresh air, with fans, supply ducts and other equipment so arranged that the conditioned air would be circulated at the rate of 8,500 c.f.m.

The equipment, as finally installed, was guaranteed to maintain an interior temperature of 80°, with 50% relative humidity under extreme load conditions, when the outside dry bulb temperature stood at 95° or higher and the wet bulb temperature was 75°.

As a preliminary to the placing of air-conditioning equipment, fans, air ducts, grilles etc., a thorough investigation was made into the possibility of utilizing the existing overhead space already mentioned, as a return duct or exhaust chamber to the fan, by making the space tight, and running the return ducts to it.

By this means, the conditioned air could be distributed direct from the supply ducts into the conditioned areas, through ceiling type low velocity grilles, while the return air could be drawn through ceiling type outlets or return grilles and returned to the central equipment for reconditioning and recirculation.

As a result of this investigation, cooling coils and fan were mounted on a platform above the salad kitchen adjacent to the duct space directly above the grille room of the restaurant, the suction of the fan being connected to this chamber, thus providing the mechanical elements needed for the proper circulation of cooled, clean air.

The fresh air supply duct was run up through the ladies' rest room of the theatre to the outside, its opening being at a height of approximately 30 ft. above the street level.

The mechanical elements of the

equipment consist of one 7½-inch x 7½-inch two-cylinder Freon compressor, equipped with 50% capacity reducing valves, and driven by a 30-hp. motor, and one 16-inch x 16 foot shell and tube type York Freon condenser and Freon receiver unit.

In addition to these are the cooling coils and one C-1500 type normal duty heating coil for heating fresh air during the winter season.

A fan and a set of special filters for freeing the air from dust and other impurities completes the equipment of this modern air-conditioning plant, which functions, as and when

needed, 12 months in the year, and enables the Nixon Restaurant and Night Club to keep open throughout the entire year.

So successfully was this installation made that there is no noticeable draft in any part of the conditioned area. Even the tables directly beneath the ornamental ceiling outlets are free from draft, and the temperature is uniform throughout the entire interior.

The equipment was installed last March, and its performance to date has been entirely satisfactory to the management of the Nixon, as well as

to its patrons. In commenting on the satisfactory performance of the equipment, A. Conforti, proprietor of the Nixon Restaurant and Night Club, said:

"We have never had any complaints of drafts or uneven temperature since the air-conditioning system was installed; in fact, judging by the comments of our patrons, we believe we have the best investment we ever made, as it has enabled us to keep open all the year round. Previously we were obliged to close the Nixon during the summer season, re-opening after Labor Day."

7,000 TONS of "FREON"* AIR CONDITIONING IN GOVERNMENT BUILDINGS IN WASHINGTON, D. C.



Library of Congress Addition—Jacobsen Bros., Chicago, Contractor. Peerson & Wilson, Architects and Consulting Engineers. "Freon" refrigeration for air conditioning by York Ice Machinery Corporation.

(Below) Senate Office Building—G. A. Fuller Co., Contractor; Geo. A. Weschler, Consulting Engineer. "Freon" refrigeration for air conditioning by York Ice Machinery Corporation.



Department of Justice Building—G. A. Fuller Co., Contractor; I. H. Francis, Consulting Engineer. "Freon" refrigeration for air conditioning equipment by York Ice Machinery Corporation.



Department of Agriculture (Administration Bldg.)—Riggs Distler, Contractor. Designed by National Park Service of the Dept. of Interior. Charles Leopold, Consulting Engineer. "Freon" air conditioning by the Frick Company.



(Left) Department of Interior (Building Old)—National Park Service, Consulting Engineer. Contractor and manufacturer of "Freon" air conditioning equipment—York Ice Machinery Corporation.



(Right) Archives Building—G. A. Fuller Co., Contractor; Clyde R. Place, Consulting Engineer. "Freon" air conditioning equipment by York Ice Machinery Corporation.

(and 4,800 additional tons for the Capitol Hill Buildings under construction)

"FREON" refrigerants are being used for most of the new government buildings in Washington.

The safety and efficiency of "Freon" refrigerants make their selection logical wherever human life and property demand maximum protection.

"Freon" refrigerants are non-poisonous, non-flammable, non-explosive. They are odorless when mixed with air up to 20% by volume. They have no harmful effects on fruits, foods, flowers or clothing. They

* "Freon" is Kinetic's registered trade mark for its fluorine refrigerants.

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FREON
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safe refrigerants

have been tested by the U. S. Bureau of Mines, and meet all specifications set by the Underwriters' Laboratories of Chicago in their report, "Standard for Commercial Refrigerating Systems" (Subject No. 207). "Freon" refrigerants are used in practically all mechanically cooled railroad trains, and in schools, hotels, mines, restaurants, stores and homes in all parts of the world.

Make sure "Freon" refrigerants are included in your specifications for air conditioning.

KINETIC CHEMICALS, INC., TENTH & MARKET STREETS, WILMINGTON, DELAWARE

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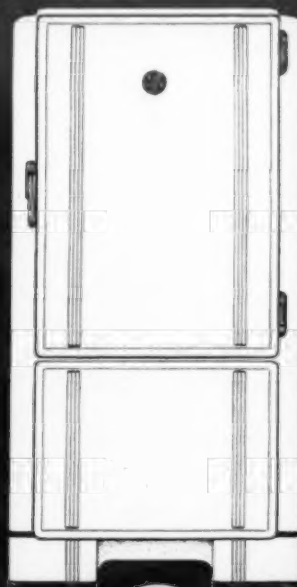
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Diesel Engine Powers Texas Hotel System

CORPUS CHRISTI, Texas—A high-speed Diesel Caterpillar engine drives the refrigeration compressor used in the air-conditioning installation in the Nueces hotel here.

This particular engine, together with its radiator, is of conventional truck or tractor design, and has been installed adjacent to the compressor upon a suitable sliding base with means for allowing adjustments to the tension of the V-belt drive through which the compressor is driven.

The compressor used is a Frick 8 x 8 unit operating at 225 r.p.m. under 225 pounds head and 25 pounds suction refrigerant pressures, at a delivery of 17 tons of refrigeration.

The service under which the equipment operates is quite severe, as the running time is 24 hours per day during six months of the year, and ranges from eight to 10 hours out of the 24 for the remainder of the year.

Installed in June, the Diesel engine has seen more than 10,000 hours of service.

This installation offers an opportunity for comparing operating costs for various types of power, as it was operated both by steam and electricity before Diesel power was installed.

According to a report confirmed by the hotel manager, the monthly cost when operating with electricity on a 24 hour basis was \$450, while the cost per month with the Diesel operating upon the same basis is \$80.

Cost of Diesel operation includes fuel oil at 5 cents per gallon, and lubricating oil (changed every 240 hours), 60 cents.

Columbus Councilman Seeks Cooled Meeting Chamber

COLUMBUS, Ohio—Forseeing hot summer evenings in poorly ventilated council chambers, City Councilman W. Herbert Dailey is working for an air-conditioning system to move air in and out of "a room where hot air sometimes becomes uncomfortable." He is seeking \$2,000 for the project.

Biehl's Sponsors Kelvinator Air-Conditioning Course

POTTSVILLE, Pa.—A course in air conditioning was conducted here the week of Feb. 15 for 75 Kelvinator dealers and their representatives. Biehl's Auto Parts Co., Kelvinator distributors for northeastern Pennsylvania, was host to the meetings, with Andre Merle in charge.

Pressure Gas Burners Added To Norge House-Heating Line

DETROIT — Pressure type gas burners designed for home heating in areas where gas burning equipment is more advantageous to the consumer are now being introduced by Norge heating and conditioning division, Borg-Warner Corp.

The new burner is equipped with a motor-driven blower providing more efficient air circulation; complete efficient combustion is secured through controlled air supply; safety is assured by a low-burning gas pilot with a 6-second safety control, a three step starting valve, outside pilot and gas pressure regulator, and a low voltage thermostat.

The Norge gas burner is available also in combination with the Norge Fine-Air furnace. The entire unit will occupy a floor space only 40x60 inches.

New Steam Boiler Control Introduced by Ranco

COLUMBUS, Ohio.—A new steam boiler control, type RLB, has been placed on the market by Ranco, Inc., local manufacturer of commercial controls.

Covers of this new control snap on and off, obviating the necessity of removing screws, and simplifying inspection and service. The dial pointer and cap are interchangeable between range and differential screw. Calibration scale indicators are visible through inclosed windows. Scales are independently adjustable.

The new principle used in switch toggle gives low differential, wide break, and positive contact pressure in the silver contacts which have wiping contact, the manufacturer claims. Copper bellows are mounted in a heavy brass housing with ¼-in. pipe thread fitting.

Electrical connections consist of placing the straight end of a skinned wire under contact screws, no eye or bend in the end of the wire being required.

For standard operations, the contacts open on an increase of pressure. The cut-in pressure plus the differential equals the cut-out pressure. A control which closes the contacts with an increase of pressure is also obtainable.

The control is available for low, medium, and high pressures. The cut-in and differential of these controls vary as follows: cut-in pressure range, ½ to 15 lbs.—differential, 1½ to 6 lbs.; cut-in pressure range, 5 to 50 lbs.—differential, 10 to 25 lbs.; cut-in pressure range, 5 to 150 lbs.—differential, 10 to 35 lbs.

Head Up Penn Switch Branches



R. V. CLARK



R. H. LUSCOMBE

COMMERCIAL REFRIGERATION

McCray Salesmen Discuss Refrigeration Problems of the Modern Baker

KENDALLVILLE, Ind.—Refrigeration problems of the modern baker and his need for commercial refrigeration equipment designed for bakery use was a prominent topic of discussion at recent district sales conventions of McCray Refrigerator Co.'s field organization, held at various points throughout the country.

At the company's Toledo sales convention, A. P. Carnahan, of Cleveland, presented a discussion of bakers' refrigeration problems, excerpts from which follow:

"What takes place behind the scenes in the bake shop? First, a baker's hours are worse than ours—half the night and half the day. And what goes into a piece of Danish pastry, for example?

"Butter and eggs are the prime ingredients, and both are expensive and hard to keep sweet and fresh. The baker buys his eggs—frozen whites in one can, yolks in another, and both mixed together in still another. If he has proper refrigeration equipment, he can buy in larger quantities at a saving in price.

"Now comes the problem: how to keep this Danish pastry dough from rising too fast? The answer is refrigeration. Not only that, but the dough must be kept on wood trays, and the baker can make up batches one or two days ahead of use if he has a refrigerator in which to keep them. Thereby time is saved, less work is called for, and the baker has time free for other duties.

"Puff paste, patty shells, and various other kinds of pastry," continued Mr. Carnahan, "must be packed in wood boxes between two pieces of paper at a temperature of 45° F. All fillings, especially cream puff fillings, must be kept in covered crocks—never in metal, because they sour in this type of container and acquire metallic tastes. These ingredients must be preserved in refrigerated surroundings.

"Open fruits in jars will also convey their taste to cream fillings if placed in the refrigerator side by side. Ice box cookies can be made up and kept almost indefinitely if placed in a refrigerator, provided they are placed on wood with a cloth between the dough and the wood.

Doughs containing yeast should never be placed on metal—always on marble or wood. Cream, too, must be kept in a refrigerator in covered crocks and stirred occasionally.

"The secret of a good 'sinker,'" Mr. Carnahan added, "lies in proper refrigeration. It is a mistake to think the mere making of dough and dipping in boiling fat makes a good

fried cake. The dough should be made up, placed in the refrigerator immediately, and chilled.

"This checks the appearance of blisters and warts on the finished doughnut or cruller. Fried cakes split open or having large bumps or 'bunions' on their surfaces have lacked proper refrigeration in the dough stage. When properly chilled and then placed in boiling fat they cook evenly and smoothly and do not require excessive amounts of powdered sugar to fill up the pores."

In discussing preservation by refrigeration of other ingredients used in baked goods, Mr. Carnahan said: "Ninety per cent of all bakers buy frozen fruit, and when this is thawed it will taste exactly like fresh fruit. When kept at proper temperatures by refrigeration frozen fruits may be preserved in the same state as they were when fresh for three or four weeks. A baker can purchase frozen fruits in bulk quantities at a saving if he has a dependable refrigerator in which to keep them.

"Most of the cream or butter icings in baked goods are made from inverted sugar—glucose and boiled water. This sweet is used in place of water for thinning out all sweet doughs and icings, and must be kept in covered crocks in the refrigerator. Shredded coconut preserved by refrigeration will keep for periods of four to five weeks and still retain its pure white color and taste.

"Glazed fruit is another product which may be preserved for long periods," said Mr. Carnahan in conclusion. "About 90% of the nuts used in baking are sold to bakers already shelled in cans, and these must be placed in the refrigerator immediately after opening to avoid spoilage. All of the baker's principal products need refrigeration—keep that in mind when selling refrigeration equipment to bakeries."

At another McCray sales meeting in St. Louis, E. E. Barbee, of the St. Louis distributorship, presented a talk on refrigeration in the baking industry.

"The smaller baker who does his own baking," said Mr. Barbee, "is a very good prospect for a bakery refrigerator with machine and ice maker for cold dough baking, a process which is rapidly coming into use in every modern bakery.

"The baker's prospects are many. First, he has as a competitor every grocery, delicatessen, and corner store which sells baked goods. Secondly, owners of smaller bakeries have the manufacturing as well as the selling ends of their business to look after; he must also do the buy-

Penn Sets Up New Dayton Branch

DAYTON—To establish closer contact with its customers in Ohio and adjoining territories, Penn Electric Switch Co. opened a new branch office at 333 Mutual Home Building here recently.

The new office is under the management of R. V. Clark, who for six years has served as manager of Penn's New York City branch. Before being appointed to Penn's New York office, Mr. Clark was on the home office staff in Des Moines.

R. H. Luscombe, who has headed the company's gas control division for the past three years, succeeds Mr. Clark as manager of the New York branch. Prior to joining Penn Electric Switch Co., Mr. Luscombe served for a number of years in the heating division of the Des Moines Gas Co.

ing. Thirdly, he must work long hours, and, lastly, his success must be derived from his ability to sell a better product than larger competitors or the wholesaler.

"The average baker arises at midnight and bakes for the day's output until dawn," said Mr. Barbee. "Unless he has refrigeration equipment, he is forced to gamble on the amount of baking done in proportion to that sold during the day. Weather conditions, which may cause a drop in sales, must be anticipated.

"A brisk day's sales may cause a shortage, and unless the baker is prepared for this emergency he sustains a loss. Without refrigeration he cannot be prepared to handle special orders on short notice because his dough will not be ready. With proper refrigeration equipment, he is ready for any emergency.

"His dough is kept properly refrigerated at a temperature of 40° F., and this temperature is maintained evenly, as it should be. Thus the baker can come to work with some pep. If the day is rainy or stormy, he bakes accordingly, knowing that his remaining dough will keep in its original condition. He becomes a better business man, saves money by reducing losses, and finds his work a pleasure.

"It is sometimes difficult to talk to the baker because he is usually in his back shop and permission must be granted to enter. The refrigeration salesman must send him in a message that will convince him that he has something of interest to say.

"In one instance, when calling on a bakery, I sent the following message to the baker in the back room: I asked the young lady in the front part of the shop to ask the proprietor if he would give me five minutes of his time to discuss bakery problems as applied to cold dough baking and refrigeration applied to this method. This obtained the interview. If I merely said I was selling refrigeration, he would not have admitted me.

"As it was, he gave me a half hour of his time," Mr. Barbee concluded. "He was a fine prospect for a bakery refrigerator, as is every progressive baker today who expects to keep abreast of his industry. We need but to study his problems, know how to approach him—and then we can sell him."

Peerless Unit Coolers Designed to Reduce Excessive Drying

CHICAGO—Designed to meet the criticism of "excessive drying" where forced-air convection is used, a new line of forced-draft unit product coolers has just been introduced by Peerless of America, Inc.

As described by A. F. Hoesel, chief engineer of Peerless of America, the new design features are:

Generous cooling surfaces to permit higher refrigerant temperatures so that excessive drying of product is avoided.

"Retarder valve" for preventing low refrigerant temperatures and resultant excessive drying of product.

"Synchro-fan" control which varies rate of air circulation to suit operating cycle of compressor.

"In stating the problem faced in accomplishing the above results we may say," declares Mr. Hoesel, "that the smaller the amount of cooling

play cases, these units should be equipped with the Peerless "retarder valve," which maintains the unit cooler surface at approximately 5° F. higher temperature than the display case or other cooling coils (for gravity circulation)."

It is claimed that with this arrangement, proper temperatures may be maintained both in the display cases and in the walk-in boxes, yet a comparatively high relative humidity may be held in the walk-in boxes.

It is explained that the Retarder Valve should not be used when the unit cooler is the only load connected to the compressor, because in that case compressor operation may be controlled by proper setting of the pressure control to balance the extra cooling surface now provided in the Peerless unit against the desired box temperature. With such installations the maintenance of high humidity may be said to be automatic.

"To get optimum results in unit cooler operation," declared Mr. Hoesel, "Peerless has developed the 'Synchro-Fan' control which cycles the rate of air circulation through the cooling unit exactly the same as, and in synchronism with, the compressor cycle of application.

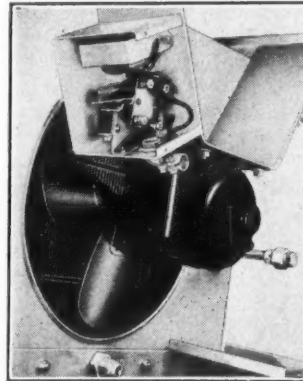
"When the compressor is on the 'on time' cycle," says Mr. Hoesel, "the air circulation through the cooling unit is at its maximum. When the compressor is on the 'off-time' cycle, the air circulation through the cooling unit is regulated to a certain volume which will allow the air to pick up the largest possible amount of moisture in the form of vapor that can be introduced into the cooler, where its presence increases the average relative humidity to a much higher degree than if such control were not used.

"The 'synchro-fan' control decreases the amount of refrigeration necessary to maintain a given temperature in any fixture, since (during the compressor off-time cycle) the air distribution is not so rapid as to continually keep washing the heated air film which is at all times adjacent to the walls of the cooled fixture."

Westinghouse Motors Promotes Thompson

EAST PITTSBURGH—J. H. Thompson, formerly handling sales promotion of motors and controls for Westinghouse Electric & Mfg. Co. here, has been appointed assistant sales manager of the division.

1937 Unit Cooler



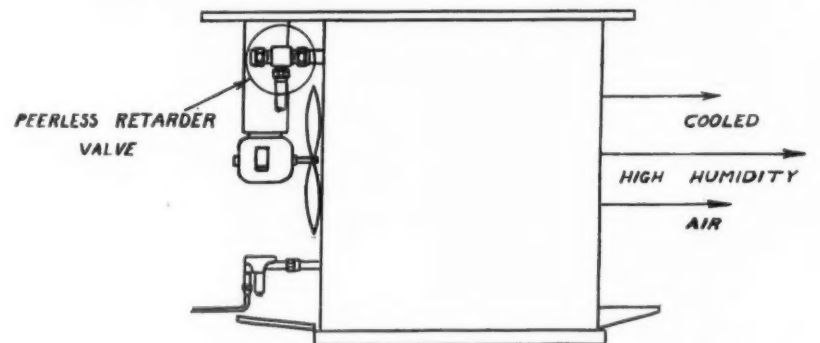
New Peerless forced-draft unit for product cooling, showing control mounting

surface for a given heat load, the colder this cooling surface must be.

"The colder the cooling surface, the more moisture will be condensed out of the circulated air and upon the cooling surface. The dryer the circulated air becomes, the more moisture will be lost by meats, vegetables, etc., with consequent decrease in weight, and loss of surface freshness, all of which results in decreased sales and loss of profit.

"When used in multiple with dis-

Use of Retarder Valve on Unit Cooler



Drawing showing where retarder valve is installed in applications where this device promotes efficiency.

● No company is continuously successful for a period of 83 years without sound manufacturing and merchandising policies—without real value being given for every dollar received.

The extensive 20-acre CURTIS plant, where every manufacturing process is under complete control, is a result of adhering to this policy since 1854. Only the finest materials and processes are used in the construction of CURTIS Condensing Units. Every point of design reflects engineering experience that can be gained only over a long period of time. Quality built the CURTIS plant and quality insures the care-free, efficient performance of Curtis Units.

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Canadian Curtis Refrigeration Co., Ltd.
20 George St., Hamilton, Ontario

CURTIS REFRIGERATING MACHINE CO.
Division of Curtis Manufacturing Co.
1912 Kienlen Avenue, St. Louis, Mo.

CURTIS



"Yes, that's right—Copelands. We tried them in three of our stores and the results were so completely satisfactory that we now have installed them throughout our entire chain."

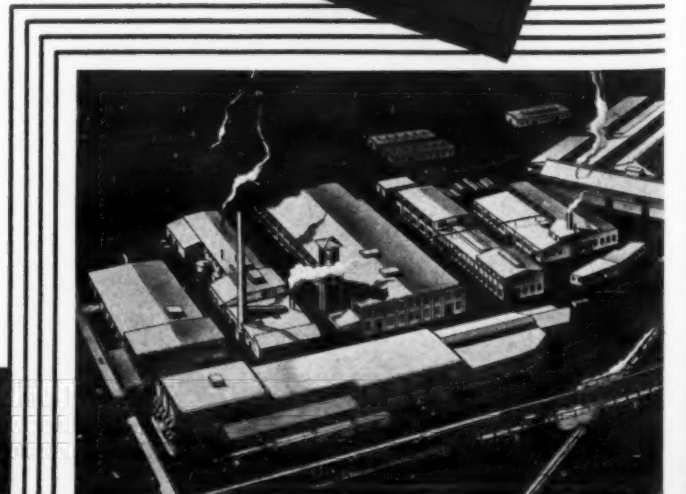
That's the way Copeland users talk. And that's why Copeland Commercial Refrigeration units are so easy to sell.

Write for our Sales Plan

COPELAND

REFRIGERATION CORPORATION . . . DETROIT, MICHIGAN

QUALITY built this plant



Model Store in Hill Display Case Plant Demonstrates Latest Merchandising Ideas

TRENTON, N. J.—Selling through teaching is the aim of the model food store which has been set up inside the plant of the C. V. Hill & Co., Inc., plant in this city.

Going on the idea that it will be easier to sell display cases—and collect the instalments—if food merchants are shown how to do more business at a profit, this store embodies the latest merchandising principles in its design.

This new store (which had a predecessor in the Hill plant) is designed for showing to groups of potential display case buyers. These groups are brought in busses to the Hill plant from neighboring communities, and cities in the New York, New Jersey, and Pennsylvania district.

Hill branches and distributors invite butchers' associations and similar organizations to an "outing" in Trenton, in order to get them in to visit the model store. Free transportation is provided, along with a luncheon or dinner.

The Hill model store is a combination of the self-service and conventional clerk-behind-the-counter store. All the counters are display cases. Elimination of counters in front of shelves, from which customers may serve themselves, not only adds space to the store, but gives the impression of even more roominess than it actually contains.

Principal ingredients of this modern store formula are evenly distributed indirect lighting, porcelain cleanliness, and judicious use of space. All lighting sources are concealed, but the uniform brilliancy is such as to give maximum display to every article exhibited.

Streamlining is the rule. Floor displays of "specials" (like boxed candy) are placed on rounded, waist-high stands. There isn't a square or sharp corner in the place.

Even the shelves are streamlined, and are self-supporting. This idea, by the elimination of the upright supports, gives additional shelf space, as well as contributing to the streamline motif.

"Demand items"—breakfast foods, bread, soap flakes, and the like—are placed at the rear of the store, so that customers will have to run the gamut of "specials" and other merchandise not so apt to be on the shopping list, before they get to the everyday basket items.

Hill display cases, finished uni-

formly in porcelain, exhibit fresh meats, perishable vegetables, and other items needing refrigeration. Fancy ice cream forms are not displayed; molds are used instead. The entire room gleams with spotless white porcelain fixtures.

Fruit and vegetables, colorfully displayed to bring out the idea of freshness and choice selection, are placed "up front" in the Hill model store. Bakery goods come next in display cases—except bread and rolls, which are tabled at the rear. Eclairs, charlotte russes, and other bakery goods with cream fillings are refrigerated at all times.

All dairy products are displayed in refrigerated cases, with separate compartments for odoriferous cheeses. Meats—refrigerated, of course—are located at the back of the store.

Tables of "specials," in addition to exhibiting products which the customer might not ordinarily expect to find in a grocery store or food market, are used to display articles for a complete meal, in order to furnish answers for perennial question: "What shall I serve today?"

Frosted Foods to Build Jacksonville Plant

JACKSONVILLE, Fla. — Establishment of a \$100,000 plant for freezing fruit, vegetables, and sea food by Frosted Foods, a unit of General Foods Corp., was announced here last week.

The plant will be equipped with a series of 10 freezers, each weighing 1,100 pounds and each costing \$8,000. Each freezing tank is to be equipped with 10 aluminum plates weighing 300 pounds, between which berries, sea foods and vegetables are to be placed. They will be subjected to a quick temperature of -30° F. and held at that point for three hours.

The frozen products will be placed in storage at the plant of the Atlantic Ice & Storage Co. here until wanted. Strawberries subjected to this treatment have kept for one and two years without losing their fresh taste.

Construction is to begin April 1.

Pernot & Rich Complete Modernization Program

LOS ANGELES—Pernot and Rich, Inc., air-conditioning engineers, have completed a modernization program embracing their show room and general office entrance.

21 New Distributors Named by Pelco

BLOOMINGTON, Ill.—Twenty-one new distributors have been appointed by Portable Elevator Mfg. Co., manufacturer of Pelco beverage and beverage-food coolers, since the first of the year. These distributors will handle Pelco sales in territories previously uncovered.

The distributors and their respective locations follow: Acme Box Co., New Orleans; Malcolm Brock Co., Bakersfield, Calif.; Bradshaw Music Co., Waycross, Ga.; Independent Brewing Co., Pittsburgh; Alamo Distributing Co., San Antonio, Tex.; Brooks Co., Atlanta; Chrisman & Foss, Fresno, Calif.

Davio Sales Co., Davenport, Iowa; Sam Horne Co., Knoxville, Tenn.; La Salle County Automatic Stoker Co., Streator, Ill.; McBrayer Bros., Rome, Ga.; Pelco Sales Co., Michigan City, Ind.; W. L. Phelps, Charlotte, N. C.; Quattlebaum Electric Co., Charleston, S. C.

Seuser Co., Albert Lea, Minn.; Shadle Radio Sales Co., Lock Haven, Pa.; Stewart-Warner Sales Co., Chicago; Stratton-Warren Sales Co., Memphis, Tenn.; Valley Electric Co., Phoenix, Ariz.; Willet's Electric Co., San Bernardino, Calif.; Gordon's, Inc., Des Moines.

Westphal Co. Moves to New Location

MANITOWOC, Wis.—The Westphal Paint & Hardware Store, distributor of Frigidaire refrigerators, air-conditioning and commercial-refrigeration equipment, last week moved to a new location at Eighth and Buffalo Sts.

In its new quarters, the firm, which was established in 1926, has several thousand additional feet of floor space. Those connected with the firm are William C. Tallmadge, A. E. McCord, Paul Donnel, Ray Evenson, George Bertler, Edna Brink, Florence Quistorf and Mrs. Charles Walt. The service department is in charge of Willard Theil and Erwin Busse.

Simpson & Bennet Lease Birmingham Building

BIRMINGHAM, Ala.—Simpson & Bennet, distributor of commercial refrigeration equipment, has leased the building at 110-112 South 22nd St., owned by the Birmingham Fire Insurance Co.

Building improvements and repairs to cost approximately \$5,000 are being made preparatory to occupancy by the tenant.

Near-Balance of Heat Achieved by Use of Waste Steam System

NEWARK—A new refrigeration application said to permit almost complete heat balance, a development of Carrier Corp., was explained by Fred Ophuls, New York consulting engineer, in an address before a special meeting of the New York Section, American Society of Refrigerating Engineers, held here Mar. 4 at the Newark Athletic Club.

The meeting, the first to be held in New Jersey, was conducted in this city in order to permit inspection of the new system at the Ballantine Brewery here.

The new refrigeration method, it was said, uses ammonia in a low-pressure condensing system, and permits heat balance by the use of steam formerly wasted. The installation at the local Ballantine Brewery was said to be one of the first of its kind in the world. (For detailed description of an application of this type, see story on page 8 of the Feb. 10 issue of the News.)

L. A. Ramsey, Chief Application Engineer for York, Dies

YORK, Pa.—L. A. Ramsey, chief application engineer of the York Ice Machinery Corp. died at his home here Feb. 5, at the age of 52.

Mr. Ramsey had been a York employee since 1906, when he enlisted in a two-year training course in which he did shop and field work. Transferred to the Brooklyn office in 1908, Mr. Ramsey was appointed chief engineer of this office in 1912, which position he held until 1932, when he was made chief application engineer at York, Pa.

CONDENSERS
COMMERCIAL EVAPORATORS
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REFRIGERATION AND
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DETROIT, MICHIGAN



(right) Pelco makes its own Floating Ice!

A BIG *New* MARKET

an AMAZING, TWO-PURPOSE UNIT—PERFORMANCE that's YEARS AHEAD—the RIGHT PRICE—and consumer acceptance!

Here's EVERYTHING You Need to Make Money!



Upper compartment makes floating ice for the most rapid and uniform cooling action known. Lower compartment is a pre-cooler for beverages or a refrigerator for foods.

Taverns, road-houses, restaurants, refreshment stands, billiard parlors, bowling alleys, resorts, hotels—any place selling bottled beverages and foods—all are prospects for PELCO. What a market! In five minutes you can find 20 or 30 prospects within a few blocks! And they've never seen a cooler like PELCO!

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Electric
Beverage-Food COOLER

MAKES FLOATING ICE

That's the reason for PELCO'S amazing capacity and economy. Cools bottled beverages from room temperature to desired degree in 30 minutes! Built on advance, proven engineering principles, beautifully finished.

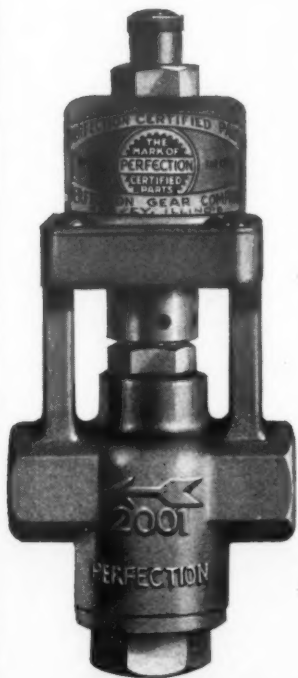
Distributors—a few choice territories still open. Dealers—write for name of nearest distributor. Address Desk A-37.

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PERFECTION
WATER REGULATORS
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VALVE BODY and YOKE are integral. Machine tolerances are held to a minimum to insure maximum Push Stem length—thus giving extreme capacity and sensitivity.

Can be mounted in a rigid position—and Valve Cap and Seat Assembly can be removed without breaking or straining water pipe or refrigerant connections.

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VALVE CAP and PISTON are made of special valve bronze and are not affected by corrosive water action. Sticking or binding of the piston in the cap is completely eliminated.

The Perfection Water Regulator is an absolutely tight-closing, wide opening, noiseless valve.

Each valve is application-tested with 200 pounds of pulsating water pressure. SEAT BEAD is replaceable. This Seat is threaded into the Valve Body and holds pressure tight by a taper which back seats at the hole of the bead.

A standard hexagon broached hole in the center of the Bead fits any wrench set or Allen Set Screw Wrench.

The Bead and Valve Disc are the only wearing parts of the Perfection Valve, and are completely replaceable without removal of the Valve from the line. This means these parts can be changed on the job at a total cost of about 25¢ for the parts and 15 minutes time.

THESE ARE BUT A FEW OF MANY SUPERIOR FEATURES of Perfection Water Regulators. Be sure to ask for complete information on these valves as well as on the entire line of Perfection Certified Parts including Compressor Parts, Valves, Fittings and Tools.

PERFECTION REFRIGERATION PARTS CO.

(A division of
Perfection Gear Company
Established 1919)



Harvey, Illinois

Commercial Refrigeration Service Manual Early Fin Coil Installation

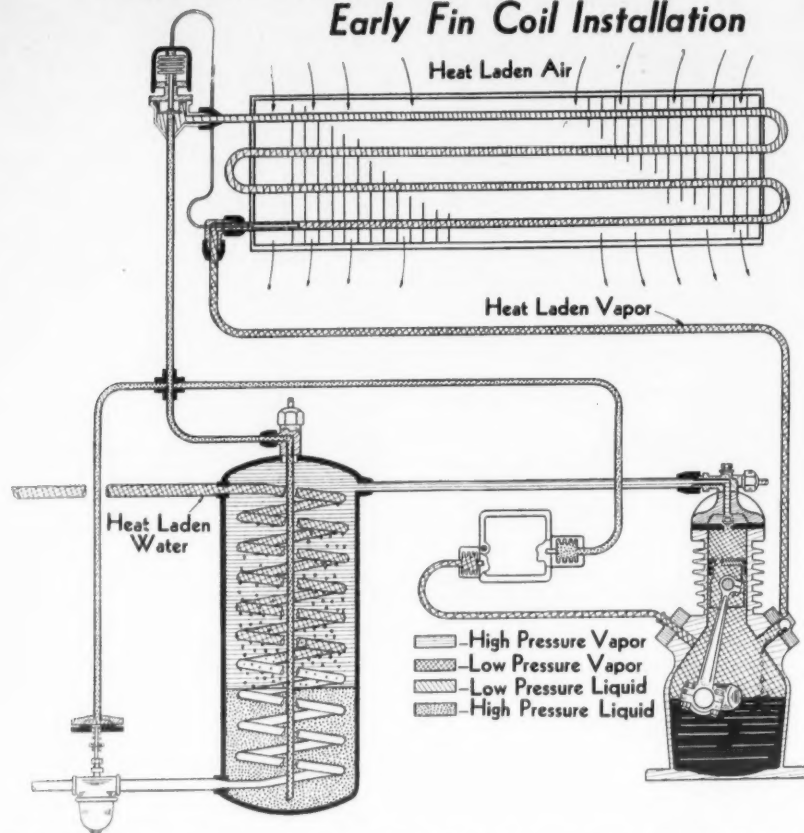


Fig. 138—Refrigerant cycle with one of first fin coils built by Larkin, used with Copeland condensing unit and Detroit Lubricator thermostatic valve.

Table 2*—Heat Conduction Through Refrigerator Wall And Through Glass

B.t.u.'s per 24 hours per square foot of outside surface.

Temperature Difference in Degrees Fahrenheit	Insulation Thickness (Cork or its equivalent)				Glass	
	2 1/2"	3"	3 1/2"	4"	Double Thickness	Triple Thickness
40°	84.0	72.0	64.0	60.0	440.0	280.0
50°	105.0	90.0	80.0	75.0	550.0	350.0
60°	126.0	108.0	96.0	90.0	660.0	420.0
70°	147.0	126.0	112.0	105.0	770.0	490.0
80°	168.0	144.0	128.0	120.0	880.0	560.0
90°	189.0	162.0	144.0	135.0	990.0	630.0

These tables are based on the use of a layer of wood, both inside and outside of the cork. If wood is not used on both sides, consider that the insulation is one-half inch less than the actual thickness.

Table 3*—Service Losses of Refrigerator

B.t.u.'s per 24 hours per cubic foot of gross interior of refrigerator.

Temperature Difference in Degrees Fahrenheit	Use of Refrigerator			
	Florist	Grocery or Normal Market	Heavier Service or Freshly Killed Meats	Restaurant Short Order
40°	40.0	65.0	95.0	120.0
50°	50.0	80.0	120.0	150.0
60°	60.0	95.0	145.0	180.0
70°	70.0	114.0	167.0	210.0
80°	80.0	130.0	190.0	240.0
90°	90.0	146.0	214.0	270.0

*TOTAL HEAT LOSS IS OBTAINED BY ADDING CORRESPONDING FIGURES FOR TABLES 2 AND 3.

TAILOR MADE PERFECT REFRIGERATION



The ANSUL Twins

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MARINETTE ♦ ♦ ♦ WISCONSIN

Synopsis of Service Manual

On this page is a continuation of Chapter 7 of the COMMERCIAL SERVICE MANUAL by K. M. Newcum, author of the popular MASTER SERVICE MANUAL.

A summary of the previous installments follows:

Chapters 1 and 2 were omitted from the News, as they are of basic material which has previously been covered in the paper, but they will appear in the completed book.

Chapter 3, Cylinders, Valves, and Safety Devices for Refrigerants—Aug. 5, 12, and 19.

Chapter 4, Methods of Transferring Refrigerants to Smaller Cylinders—Aug. 19.

Chapter 5, Drying of Refrigerants—Aug. 26.

Chapter 6, Commercial Condensing Units—Sept. 2, 9, 16, 23, 30; Oct. 21; Nov. 4, 11, 18, 25; Dec. 2, 9, and 16.

Chapter 7, Evaporators and Refrigerant Control Valves—Dec. 23, 30; Jan. 6, 13, 20, 27; Feb. 3, 10, 24; and March 3.

Electrical Displays to Dominate Exposition

SAN FRANCISCO—Electrical displays will occupy a dominant position at the Golden Gate International Exposition to be held Feb. 18 to Dec. 2, 1939, on a man-made island in the middle of San Francisco Bay, according to Arthur H. Halloran, chief of the exposition's electricity and communications division.

Believing a mass presentation to be more effective than a few scattered exhibits, Mr. Halloran is attempting to closely coordinate the exposition's electrical displays into a single, comprehensive story of electrical progress. A committee of the San Francisco Electrical Development League has been working for more than a year to achieve this same result.

Power companies are considering a plan for the installation of a great diorama occupying 10,000 sq. ft. of wall space along one end of the electrical building. The drama of harnessed horsepower will be enacted against a scenic background through use of working models of generating equipment and other power machinery. To the accompaniment of sound

effects and ingenious lighting, exposition visitors will be shown the story of what lies behind the consumer's meter.

Along the opposite wall of the building is to be a pictorial map of electrical communication facilities of countries bordering the Pacific. Moving lines of colored lights will mark the courses of messages along the coasts and across the ocean, whether by wire, cable, or radio. Fronting the map will be displays by telegraph, telephone, and radio companies.

The remainder of the electrical hall will be filled with working exhibits of the innumerable domestic, industrial, and agricultural applications of electricity. Stress will be placed on modernization of installations, and rural electrification.

The development of great new western power projects such as Boulder Dam, Grand Coulee, Bonneville, and Fort Peck will be dramatized. Through the cooperation of Radio Relay Leagues, shortwave radio operators will be enlisted to send visitors' messages to any part of the country through amateur stations. Elaborate plans are being made to display television as the final dramatic achievement of electricity, alongside the radio and the telephone.

COMMERCIAL REFRIGERATION SERVICE

Design & Installation of Dry Expansion Or Fin Coil Evaporators

CHAPTER 7—Evaporators & Refrigerant Controls (Cont.)

BY K. M. NEWCUM

Expansion type evaporators are so named as they employ either the automatic or thermostatic expansion valve as the refrigerant control.

They are often termed "dry expansion evaporators" and this term is explained as implying that while there is most always liquid present in the evaporator, it is not necessarily held to a predetermined level as in the flooded evaporator.

Expansion type evaporators are most always of the cross-fin type and for brevity they will hereinafter be called fin coils.

Fig. 138 shows one of the first fin coils made by Larkin and used with Copeland water-cooled condensing unit and the original American Radiator (Detroit Lubricator) thermostatic valve.

From this illustration, the cycle of operation and the refrigerant circuit may be clearly followed.

Note the fin coil is one continuous tube with the expansion valve connected to the top, inlet end of the coil, while the suction line is connected to the outlet of the coil. Note the thermostatic expansion valve bulb is located inside the suction line at the outlet end.

Tracing the refrigerant circuit, high pressure liquid is carried via the liquid line to the inlet of the expansion valve. At the start of the compressor cycle, heat-laden air has heated the thermostatic bulb slightly causing it to exert pressure on the power element bellows opening the valve a little. This allows the high pressure liquid to be admitted to the evaporator changing its pressure to become a low pressure liquid when passing through the expansion valve.

This low pressure liquid is literally sprayed into the evaporator where it picks up heat from the surrounding tube and fins thus boiling and changing, as it travels along the coil, to a low pressure vapor.

As the refrigerant nears the end of the coil, it has changed almost entirely to a gas. Refrigerant continues to spray into the evaporator, absorb heat and vaporize, thus reducing the tube and fin temperature until a natural air circulation is set up and heat-laden air is continuously passing over the coil to be cooled and dropped down into the refrigerator to set up a circulation within the refrigerator.

As the refrigerator temperature is reduced gradually by the continued operation of the compressor, the evaporator temperature is also gradually reduced and less evaporation takes place which allows more liquid refrigerant or saturated vapor to travel with the gas to the end of the coil. As this liquid or saturated vapor comes in contact with the thermostatic bulb, it chills it thereby contracting the bellows in the power element which tends to close or throttle the expansion valve.

As a result of the throttling or closing of the expansion valve the suction pressure and temperature of the coil will be lowered to a point where the cutting-out point on the pressure con-

trol is reached and the control cuts out, stopping the compressor.

With the compressor idle no evaporation is taking place and with heat-laden air circulating over the coil, the pressure in the coil gradually builds up with the gradual increase in refrigerator-evaporator temperature.

This increase in coil and low-side pressure responds on the bellows inside the expansion valve to keep it closed.

When the pressure has finally increased to the cutting-in point of the pressure control, the compressor starts.

The pressure in the low side is immediately reduced by the action of the compressor until the lower pressure on the inside bellows allows the higher pressure in the power element (thermo bulb, etc.) to overcome this inside bellows thereby causing the expansion valve to open and the cycle is repeated.

The original fin coils were designed to give 100% vertical surface. By this it is meant that the coil had sufficient tube and fin surface to provide one square foot of coil surface for each one square foot of refrigerator surface.

This arrangement was made possible by the fact that more or less fin surface could be installed on a coil of a given dimension by increasing the size of the fin or by increasing the number of fins per inch of tubing.

It has been found, however, that there is a direct relation to fin and tube surface, or what is the same thing, primary and secondary surface. The tube being the primary surface and the fins the secondary surface. The size of the fin is given first consideration as tests reveal that if the fin is too large, it is not as effective as the same amount of fin surface made into smaller fins and spaced closer together on the tube.

In other words, the purpose of the fin, in effect, is to reach out and conduct the heat units to the tube, hence the refrigerant. If the fin is too large, or extends too far from the tube, the rate of conduction is slow and the effect of the fin is less in proportion to its size than a greater number of smaller fins having the same number of square feet of surface.

Fin spacing on the tube may vary from one fin per inch to as high as four per inch. Fins used on modern coils are usually not more than 4

inches square, while 3-inch fins are found to be popular.

For all common refrigerants except ammonia, fin coils are made of copper tubing. Fins are made either of copper or aluminum depending on the manufacturer's design.

There are several different methods of effecting a thermal contact between the fin and the tube. One method, where copper fins are employed, is to solder the joint between fin and tube.

A second method is to slide the fin in place on the tube and expand the tube from the inside with pressure or a special tool to form a tight contact.

Another method is to slide the fin over the tube with the fin flared out slightly at the hole and then press this flare back into shape which locks the fin onto the tube.

In assembling a fin coil, the several tubes are connected at the ends by return bends of copper tubing. The return bends are soldered to the tube. Some of the older coils were soldered with half and half solder, but later methods employ either silver solder or its equivalent which precludes the possibilities of leaks at these joints. One manufacturer assembles fin coils from one continuous tube, not requiring the use of soldered return bends.

Aside from possible leaks there is little actual service, as the word implies, for the service man to do on a fin coil. By this it is meant that the coil is one piece non-adjustable and when it is installed properly in the refrigerator, it should not represent any service problems.

The most pertinent service factor is the expansion valve controlling the flow of refrigerant to the coil. Expansion valves will be dealt with in some detail.

There are, however, some important factors affecting coil operation that should be fully understood by the service man. The most important is the selection of the coil. Next most important factor is the location of the coil as regards its relationship to the baffles or baffle, and then the temperature to be maintained in the refrigerators.

The selection of the coil is usually made by the sales or engineering department when estimating the actual refrigeration load. If the refrigerator is of good design and construction, insulated with at least 3 inches of corkboard, or its equivalent, located in a normally cool room, with a small amount of service and product load, it will not require as much coil surface to maintain suitable temperatures as would a poorly constructed refrigerator with loose fitting doors and windows, poorly insulated, with a heavy load and high room temperatures.

In other words, the size of the re-

(Concluded on Page 21, Column 1)

Artic

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(DU PONT METHYL CHLORIDE)

COAST-TO-COAST DISTRIBUTION—The standard Methyl Chloride. Stocked in standard and special 20-lb. containers for prompt delivery at 65 stock points in 46 cities; also Cuba, Mexico and Hawaiian Islands.



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Farmers Use Electricity to Thaw Calves' Ears, Make Cider, Feed Frogs, Fight the Drought

JACKSON COUNTY, Mo.—When electrification was extended to rural districts here, it presented a challenge to the farmer's crafty minds—resulting in new applications of electrical appliances. Among the strangest reported to date are:

Use of a woman's hair dryer to thaw the ears of seven new-born calves, and then to keep them warm. These were the calf-saving tactics of J. H. Lenz, breeder of purebred cattle. Mr. Lenz borrowed his wife's electrical hair dryer and attached it to a socket in the barn. "It worked perfectly, completely thawed out the calves, and they weathered the below-zero weather," he claims.

Placing a radio in the barn while milking cows, was the idea of Robert W. Barr and Edward Watson, owners of a dairy farm here. "If cows are discontented for any reason, they will not give as much milk as if they were comfortable," Mr. Watson explains. "Our cows listen to the radio and are pleased by it. We have found

that our cows give more milk when the radio is playing than when it is not."

Electricity has proven a life saver for N. G. Norris, operator of a large frog farm, who says that his business would not be profitable without it.

Frogs must have fresh food, and they like insects, he explains. So Mr. Norris placed electric lights at various points close to the surface of his frog ponds. The lights attract insects to the water, and the frogs rise to the surface and feast upon insects. Water raised from wells by electric pumps, is fed into the ponds and ditches of this frogery.

Last is the case of John H. Stevens who states that electricity helped him to fight the drought. With his corn withering from the lack of rainfall last summer, Mr. Stevens kept a one-acre field of seed corn alive by irrigation sprays from overhead pipes. Water for this purpose was pumped electrically from a 90-ft. well.

COMMERCIAL REFRIGERATION SERVICE

Table 4—Ratings of Type M Coils for Standard Market Coolers

B.t.u. rating per 24 hours can be determined by multiplying square feet of surface by 300. Information on Square Feet of Surface is approximate and for estimating Only.

Model No.	Size of Market Cooler		No. of Evaporators Required	Dimensions of Evaporator			Sq. Ft. of Surface		No. of Tubes
	Width Ft.	Depth Ft.		Height In.	Width In.	Overall Length In.	Tubes	Total	
54-192-M	5	4	1	12½	19½	43	8.3	173.7	12
64-240-M	6	4	1	12½	19½	49	9.5	200.5	12
65-240-M	6	5	1	12½	19½	50	9.6	232.4	12
75-287-M	7	5	1	12½	19½	64	12.4	270.6	12
76-287-M	7	6	1	12½	19½	62	11.9	297.1	12
86-345-M	8	6	1	12½	19½	69	13.3	335.7	12
88-229-M	8	8	2	7	21	71	13.7	186.3	200
97-229-M	9	7	2	7	14	81	10.3	189.7	200
106-441-M	10	6	1	12½	19½	86	16.6	380.4	397
108-251-M	10	8	2	7	21	83	16.0	220.0	236
1210-345-M	12	10	2	7	21	82	16.0	288.0	304
65-192-M	6	5	1	16½	14½	42	9.4	186.9	185
66-240-M	6	6	1	16½	14½	49	9.4	225.6	235
76-288-M	7	6	1	16½	14½	60	11.6	251.4	263

Data on Selecting Coils Given

(Concluded from Page 20, Column 5)
Refrigerator does not necessarily determine the size or capacity of coil. The total load is comprised of such factors as total outside surface, kind, thickness and condition of insulation, size, number and condition of glass doors, condition and location of large door or doors, maximum natural room temperature, artificial heat load (such as would be encountered in restaurant and hotel kitchens), amount, specific heat and temperature of product, persons, electric lights, and other heat-imposing devices inside of refrigerator, service load, average inside temperature to be maintained, and operating time of compressor.

Fedders, for example, have simplified the method of determining or selecting the total number of square feet or coil surface of their flat fin coils, as illustrated in Fig. 139. This method also determines the proper size coil for the particular size refrigerator.

Table 2 gives the heat conduction through refrigerator walls and through glass in B.t.u.'s per 24 hours, per square foot of outside surface. Table 3 gives the estimated service losses of the refrigerator in B.t.u.'s per 24 hours per cubic foot gross interior of refrigerator.

Note first column, Table 2, shows temperature difference between maximum and minimum inside temperatures in degrees F. The insulation thickness is given in inches of cork or its equivalent, the glass for doors and windows is given in double and triple thickness.

Under Table 3 the estimated service load, expressed in "Use of Refrigerator," is given for florist, grocery or

normal market (by normal market it is meant that the refrigerator is subjected to only a normal or relatively small amount of service), market with heavier service or freshly killed meats, (a heavy service market is one where the refrigerator is in almost constant use). The cooling of freshly killed meats represents approximately the same service factor as the heavy market and restaurant short order.

The restaurant short order box is generally in a hot kitchen and is in almost constant use; thus its service loss or load is the highest.

Note in Table 2 the vast difference in heat leakage through the walls; for example, a refrigerator with a temperature difference of 40° F. with 4 inches of cork insulation as compared with a refrigerator having a temperature difference of 60° F. with 2½ inches of insulation. The first example has a heat leakage factor of 60.0 B.t.u.'s per square foot, while the second has a factor of 126 B.t.u.'s or more than twice as much.

The same vast difference holds true on the service loss factor as may be noted from Table 3.

The examples are given to illustrate the fact that the size of the refrigerator is not necessarily the determining factor in selecting a coil.

Fedders also provides an example showing the application of the tables and actually how to figure a coil for a typical market refrigerator. It is as follows:

Outside dimensions: 8 feet wide x 6 feet deep x 10 feet high.

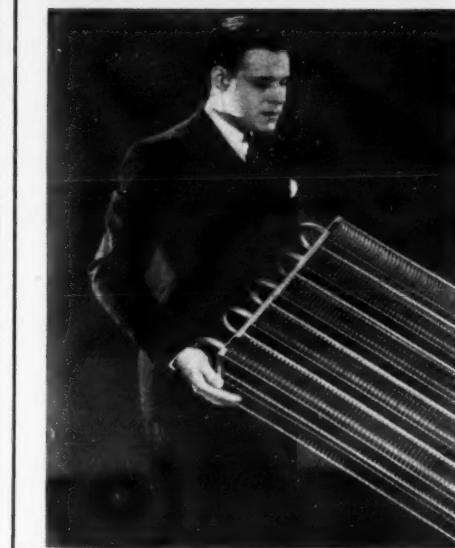
Two triple-glass doors, 33 inches high x 22 inches wide.

Two and one-half inch cork insulation with wood lining inside and outside.

Room temperature 98° F.

Box temperature 38° F.

Outside surface:



— BUYER'S GUIDE —

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Built by Peerless of America (formerly the Peerless Ice Machine Co.) according to G-E specifications, these new cooling units are the result of years of experience and research. Every unit is "tailor made." Shipment of any size or type of unit is made within 24 hours of receipt of order. Three shipping points—Chicago, New York or Los Angeles help speed delivery and reduce shipping costs. Write today for full details and prices or see your local General Electric distributor.

GENERAL ELECTRIC COMPANY

Commercial Refrigeration Division

NELA PARK

CLEVELAND, OHIO

—and now the new IMPERIAL "SYLPAK"!

IN THE greatly expanded 1937 line of Imperial products for refrigeration and air conditioning work is a complete new group of Sylpak Shut-off Valves. These valves have a shorter bonnet and fit in a 4-inch conduit box.

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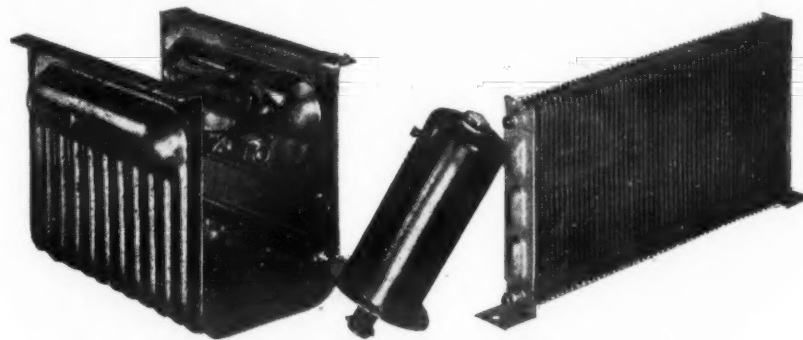
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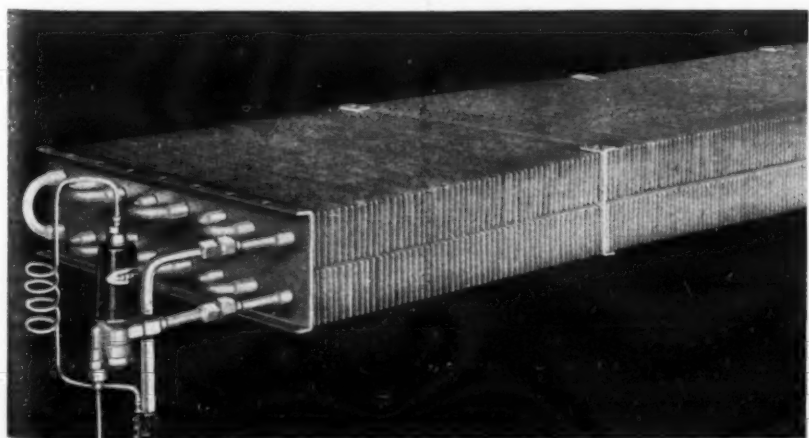
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MARSH Refrigeration Instruments

Fig. 139—Fedders Flat Fin Coils



Two Months' G-E Orders Up 79% over 1936

NEW YORK CITY—General Electric orders received during the first two months of 1937 amounted to \$64,000,000, an increase of 79% over the corresponding period last year. Sales billed in the first two months were \$45,000,000, an increase of 39% over the same period last year. On March 5 was declared a dividend of 40 cents share for the first quarter.

— BUYER'S GUIDE —

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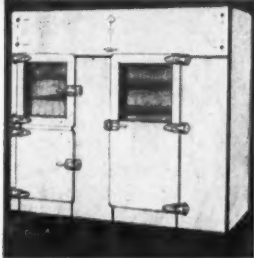
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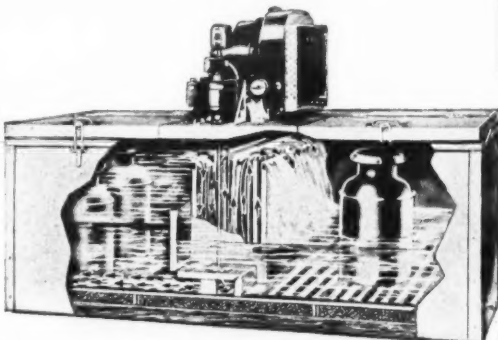
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FOR PROPOSITION

Popular Air-Conditioned Grill Built in Former Waste Space

ERIE, Pa.—“Booked three months in advance,” is the word sent out regarding the grillroom made possible by air conditioning in the old location of a former ice-making room of the Erie Brewing Co. here. It is said that as many as 125 smokers can be crowded together into this practically air-tight windowless room without disturbing the comfort conditions maintained.

When the Erie Brewing Co. management found itself with an old disused ice-making room on its hands, the idea was conceived of turning it into a source of revenue by converting it into a grillroom. However, without the aid of air conditioning the realization of this brilliant scheme would have been impossible, because the room in question was a damp unventilated space.

With the space made usable through the removal of the disused refrigeration equipment, it was converted by extensive alterations and decorations of suitable character into a replica of the early American taproom so popular as a social center in the old Colonial days.

Air Conditioning MADE EASY

Presented below is a continuation of Section 7, Heating, of AIR CONDITIONING MADE EASY, by F. O. Jordan, air-conditioning editor of the NEWS, and former assistant chief engineer of Airtemp, Inc.

The following instalments of the manual have appeared in the NEWS: What is Air Conditioning?—Sept. 23. Section 1, Introduction, and Section 2, Definitions and Simple Thermodynamics—Sept. 30.

Section 3, Coil Performance—Oct. 7 and 14.

Section 3A, Water Cooler Performance—Oct. 14.

Section 4, Condensing Unit Performance—Oct. 21.

Section 5, Air Movement and Ventilation Requirements—Oct. 28.

Section 6, The Complete Air-Conditioning System for the Cooling Season—Nov. 4, 11, 18, and 25.

Section 7, Heating—Dec. 2, 9, 16, 23, 30, Jan. 6, 13, 20, 27, Feb. 3, 10, 17, 24, and March 3.

— AIR CONDITIONING MADE EASY —

Heating System Specifications Concluded; Hints on Trouble Shooting

SECTION NO. 7 (Concluded) HEATING

BY F. O. JORDAN

Specifications (Continued)

25. *Hangers and Supports:* All piping and equipment must be properly supported.

Supports for legless radiators must be securely anchored to building construction, so as to avoid strain due to expansion and contraction.

Supports for pipe are to be spaced 10 feet apart and located at all turns and at all ends of runs. These supports are to be adjustable, expansion type, securely anchored by “through” bolts or “toggle” bolts.

Duct hangers are to be strap iron type on 8-foot centers, and at turns and ends of ducts.

Boilers and furnaces are to be provided with suitable concrete foundations, as necessary to properly carry and distribute the load.

Foundations for pumps are to be 1-2-4 mix concrete, 6 inches high with proper adjustable anchor-bolts and sleeves. Foundations for fans and motors are to be built up of cork and plank, or of other approved sound and vibration-proof material.

26. *Gaskets:* Hard asbestos composition, ring type, between all flanges.

27. *Packing:* Best grade graphited fiber, in all pump and valve glands.

28. *Unions:* All valves, at connections to equipment, and at other locations as necessary to facilitate removal of piping or equipment, are to be ground joint if 2 inches under, or flanged if over 2 inches.

29. *Water Feeders:* Cast iron, brass, or bronze fitted, capacity, g.p.m. against lbs. boiler pressure lbs. pressure on water supply (with overflow feature if desired).

30. *Fans:* Centrifugal blower (or propeller) type, with V-belt (or direct) drive and self-oiling bearings. Construction is to be of sufficient weight to prevent vibration. Capacity, c.f.m. against static water pressure at f.p.m. tip speed and f.p.m. outlet velocity maximum.

31. *Motors:* Totally enclosed (or ventilated) type with self-oiling sleeve (or ball) bearings, built to Nema specifications for 1 phase, 60 cycle, 110/220 volt (or other) current. Provide slide rails, pulleys, and V-belts (or shaft couplings for direct drive). Capacity, hp. continuous at 40° rise.

32. *Starters:* Manual snap switches for ½ hp. or under. Magnetic type with push button control, and with no voltage and inverse time overload protection where over ½ hp., “across-the-line” type where under 7½ hp., and “resistance” type where 7½ hp. or over.

33. *Ducts:* Galvanized sheet metal, constructed according to Table No. 23, Section No. 21.

34. *Smoke Connections:* Constructed of 18-lb. gauge galvanized iron with riveted or locked joints.

35. *Dampers:* No. 18 gauge on easy-working, rattle-free trunnions, with operating lever for automatic dampers, and with quadrant and lock for

volume dampers.

36. *Registers & Grilles:* Directional type for supplies, and lattice type for vents, mounted level, and even with plaster line. Material is to be pressed steel (or bronze).

37. *Filters:* Glass or metal wool packed (or paper mat or screen) type. Capacity, c.f.m. with not over inches water pressure drop, when clean.

38. *Fan Connections:* Connect fans to ducts with suitable vibration-proof, air-tight elastic or canvas bands.

39. *Automatic Controls:* See “Automatic Controls” above.

40. *Insulation:* Insulate ducts with sheet asbestos, as necessary to protect adjacent materials, and with 1-inch-thick wool felt wired on with copper wire where exposed to unheated or outside air.

Insulate heating lines with ¾-inch-thick asbestos air cell sectional covering with jacket pasted on and secured with covering bands on 24-in. centers.

41. *Adjusting & Finishing:* Clean boiler thoroughly with Sal-soda or white vinegar (1 lb. Sal-soda per 10,000 B.t.u., or 1 gallon vinegar per 50,000 B.t.u. boiler capacity) until the water level remains steady.

Run performance test on all equipment and prove satisfactory.

Adjust all controls until they function as required.

Adjust dampers until air distribution is properly proportioned.

Test entire system and prove satisfactory.

Trouble Shooting

Unfortunately, the work of the heating engineer does not always end with the design and installation of the heating system, for he frequently is called upon to find a remedy for the system which does not function properly. Therefore, the heating engineer must round out his repertoire with a knowledge of “trouble shooting.”

One of the most frequent causes of trouble with the steam heating system is a dirty boiler which is “priming.” The presence of dirt, oil, or other foreign matter produces “priming” or violent foaming of the water within the boiler which results in large quantities of water being carried over from the boiler into the system, where its presence very seriously interferes with the functioning of the system. The existence of “priming” conditions are indicated by an unsteadiness of the water level in the gauge glass during operation, and by a sudden falling of the water level when a steam pressure begins to show in the pressure gauge.

Another check is to drain off a sample of water from the boiler and boil it in a suitable receptacle. If the water contains ingredients which cause “priming,” a large quantity of fine foam will result, instead of the usual boiling action obtained with clean water.

The presence of water in the system

may be detected by placing small pet-cocks in the bottoms of steam mains, and in heating units which are not far above the boiler.

Before the new system is placed in service, the boiler must be thoroughly cleaned, and it must be cleaned again after having been in service for a short time. If “priming” yet occurs, this cleaning must be repeated periodically until no “priming” can be detected. The cleaning should be done by placing Sal-soda (1 lb. per 10,000 B.t.u. per hour boiler capacity) or white vinegar (1 gal. per 50,000 B.t.u. per hour boiler capacity) in the boiler, and boiling slowly for several hours with the safety valve open.

The soda or vinegar may be introduced through the safety valve, or other suitable opening. After boiling, the water supply valve should be opened, and the boiler allowed to over-flow through the safety valve, or other opening in or near the top of the boiler until the water in the boiler has been completely changed.

If the boiler is drained at the bottom after boiling, the scum of dirt and oil which is on the surface of the water will be allowed to adhere to the inside surfaces of the boiler. After the boiler has been thoroughly drained off at the top, it may then be drained at the bottom.

When Sal-soda is used as the cleaning agent, it is very essential that all traces of the soda be removed, as it will cause “priming.” In fact, if Sal-soda is used, it is a good precaution to clean the boiler afterward with vinegar.

In addition to being carried over by “priming,” a common way for the water to be taken from the boiler is for it to be driven out through the return, in the case of installations having no check valve in the return. In the case of “vapor” or “vacuum” systems in which all return and drip connections are made to the return system through traps, so that no steam pressure exists within the return system, it is necessary for all heating units and dry returns to be at a level which is high enough above the boiler water line so that water will not back up into them before its head is sufficient to overcome boiler pressure and water friction through the wet return.

In cases where the height of the dry return or heating unit above the boiler water level is less than 2½ feet per pound of boiler pressure, the dry return or heating unit must be raised or a condensate return pump must be installed.

However, in the case of the “gravity” system in which return and drip connections are made to the return system without the use of traps so that steam pressure is carried on the dry returns, it is necessary for the return head to be sufficient to overcome the friction only of the system, as the boiler pressure is balanced by the return pressure.

Thus, in cases where the heating is accomplished by an air-heating and circulating unit located adjacent to the boiler, the coil need be only

(Concluded on Page 23, Column 1)

ASK FOR NEW
BULLETIN 144C
“T” Series Thermo Valves
ALCO VALVE CO., Inc.
ST. LOUIS, MO.

Friez Introduces New Line of Air-Measuring Instruments

BALTIMORE—Julien P. Friez and Sons, Inc. have just introduced a new line of improved air-measuring instruments, including air meters, draft gauges, air-filter gauges, and a pitot-static head.

The manufacturer claims that the new line is unusually sensitive, rugged, and reliable, and that a number of improved features are included. Tubing and fittings, as well as easily operated adjustments, are provided where necessary.

The gauges are made of clear bakelite, with a highly polished chromium plated scale arranged to reflect an image of the liquid column in such a way that errors due to parallax, inherent in previous instruments of this type, are entirely eliminated, it is said.

Principal feature claimed for the pitot-static head is its extreme accuracy even if turned as much as 15° to either side of the air stream. This instrument requires only a 1/2-inch opening in ductwork for its insertion. It is made especially for use with the Friez gauges, but can be used

with other makes of instruments also. The new line of instruments includes types and ranges covering air velocities ranging from 500 to 8,000 f.p.m., and pressure and vacuums ranging from .005 to 4 inches of water.

Air Conditioning Makers to Exhibit at Home Show

CHICAGO—A number of manufacturers of air-conditioning and oil burner equipment are among the 44 firms who have already booked space for the National House & Garden Exposition to be held in the Coliseum here, Nov. 8-16, reports John A. Servas, show manager.

Planned as a "clinic to present the home builder with the newest ideas in home building and equipment," the show has been endorsed by the following associations: The Brick Manufacturers Association, Central Division of the Architects Small House Service Bureau, National Warm Air Heating and Air Conditioning Association, Metal Lath Association, Illinois Chapter of American Society of Heating and Ventilating Engineers, Oil Heat Committee and Burning Oil Distributors Association.

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To the salesman, the Specifications Book is an important accessory in helping him determine the trade-in value of a used refrigerator. The book gives the list price of the refrigerator at the time it was sold, and lists its cubic foot capacity, interior and exterior cabinet dimensions, shelf area, finish, and all other factors which must be considered when a price is made on a trade-in.

Price \$3.00 per copy . . . Send order with remittance to

BUSINESS NEWS PUBLISHING CO., 5229 Cass Ave., Detroit, Mich.

AIR CONDITIONING ENGINEERING

Trouble Shooting in Heating Systems

(Continued from Page 22, Column 5)

about 18 inches above the boiler water line, if no trap is provided in the return line, if the pressure drop through the heating coil and piping is very low, and if in the dry return there is installed an air valve of a type which not only allows air to vent from the system, but also allows air to return to the system (and so prevents formation of a vacuum due to condensation of steam within the heating coil after the steam supply is shut off).

CHECK VALVE DESIRABLE

A check valve in the wet return main is a very desirable precaution in such a system, as it will prevent water from being forced from the boiler, through the return, and into the coil, a result which often occurs during unbalanced conditions of starting up when the coil is but a short distance above the boiler water line. Frequently, a check valve will cure very unsatisfactory systems.

Water may be held up in the system also by the vacuum created by a condition where steam is condensed in radiators or coils more rapidly than it is supplied. This condition generally is produced when some form of automatic control is used to restrict or shut off the steam supply to a heating unit by operating a throttling valve, or by restricting or stopping boiler output.

Under such conditions, the condensing of the steam remaining within the unit produces a vacuum which may retain condensate or which may draw water from the returns or from the boiler.

This condition is especially bad when the system is divided into separate sections, each with its individual automatic shut-off valve. With this arrangement, the vacuum formed in one section when it is off may draw the condensate which is discharged by another section which is operating, thus, allowing the boiler water level to become dangerously low.

Such a condition may be remedied by installing air valves of a type which permit air to enter, as well as to leave the system, on the dry returns, or on radiators and coils, and/or by installing check valves in return connections.

Presence of air within the steam radiator or coil is as objectionable as the presence of water. If the radiator or coil is partially or entirely cold, examine the traps (if traps are used) and ascertain if they are a type which pass air, or if air valves are used, make certain that they are functioning.

ing. If no means of venting are provided, either direct to the atmosphere by means of an air valve, or to a dry vented return, an air valve must be provided.

AIR IN SYSTEM

Dry returns must be vented through suitable air valves, preferably at the point where they drop to a wet return. Vacuum returns, and returns which terminate in a vented receiver require no vent. The presence of air in piping or heating units may be detected by removing the air valve, or a suitable plug, or by loosening a fitting and hearing if air escapes.

If a heating unit is furnished with a trap which does not pass air, it must be provided with its own air valve. Otherwise, the best location for the air valve is on the dry return, as described above. If possible, the air valve generally should be placed a foot or more above the point of connection to the system by means of a 1/4-inch connection so that it will not be closed prematurely by the presence of steam.

Heating units which have been proven to be free from binding and which get cold or do not heat properly must, of necessity, be water-logged. If any evidences of "priming" exist, as described above, clean the boiler, as described, until such evidences disappear. Note the elevation of such water-logged unit above the water line and determine if the head is sufficient, as described above, depending upon the type of system.

WATER-LOGGED UNITS

If the elevation seems to be ample and if the boiler is not "priming," remove an air valve, or plug, or open a fitting so as to admit air to the water-logged unit and find if the breaking of a possible partial vacuum allows the water to return. If this is found to be the case, install an air valve which will prevent escape of steam or water, but which allows air to pass either in or out of the unit or piping.

In fact, many "trouble shooters" upon visiting a troublesome installation, first remove all air valves of the non-return or vacuum type on general principles, especially if installed on forced air circulation coils.

Even in the case of installations where the elevation of the heating units seems to be ample, and where water is not held up by other means, water may be passed to the heating units during certain unbalanced conditions of starting. In such cases, check valves in return connections to the affected units, or in the boiler return will remedy the situation. Yet, check valves which stick shut are sometimes a source of trouble, so that unsatisfactory installations sometimes are remedied by the removal of the check valve.

In the case of the installation where the heating unit is very little above the boiler water line, the steam pressure drop through the steam line and through the coil may be sufficient to force the water back through the return to the coil as stated above. In such cases, this pressure drop may be ascertained by suitable gauges, and if too great, the condition must be corrected by changing globe type shut-off valves to gate type, by increasing pipe sizes, or by eliminating turns and off-sets. In addition to this, a check valve in the return may be necessary, as stated above.

The entire installation should be checked for the purpose of finding if piping is properly sloped and if connections are properly made, or if sags and water pockets, etc. exist, especially if "water hammer" or gurgling noises occur. Water pockets must be relieved, either by sloping the pipe properly, or by installing drip traps.

In the case of the hot water system, the air will tend to rise to and collect in the high points. Therefore, automatic float air valves must be installed at all high points in piping, and either automatic or hand air vents must be installed in all radiators not located so that they will vent to a higher main.

SHORT-CIRCUITING

The common difficulty with the hot water system is short circuiting of water around portions of the system. This trouble may be eliminated by installing connections as shown above, by increasing pipe sizes in short-circuited portions, or by installing restrictions in the form of orifices, throttling valves or smaller pipe in circuits through which the short-circuiting occurs.

In the case of the duct system through which insufficient air is being delivered, the condition often may be remedied by a readjustment of the dampers. On such an installation, all volume dampers should be opened wide, and the air to each opening measured by means of a pitot tube in the duct (if straight runs of five feet are available, and if velocities are 600 f.p.m. or greater), or by anemometer or velometer. The volume dampers in ducts which carry too much air should then be closed only enough to restrict the air to the required amount.

If the total air delivery is yet too low, it may be necessary to straighten out sharp bends and off-sets, and sudden transformations, or it may be necessary to speed up the fan.

About the most accurate practicable method of field measurement of total air quantity moved by a fan is to read the watts taken by the motor, the r.p.m. of the fan, and the total resistance pressure (discharge plus action) against the fan by means of a draft tube and draft gauge. By checking this data against the capacity table or curve of the fan, a fairly reliable estimate of the air quantity may be made.

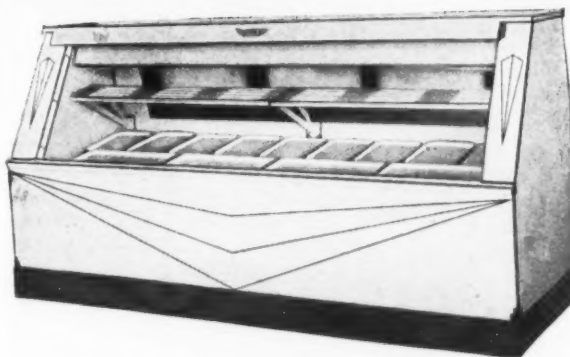
In cases where noises are carried into a room through certain air inlets, the condition may be remedied by enlarging or straightening of ducts, or by insulating the inside of duct work with sound-deadening felt. With good insulation, the noise level may be reduced one decibel per foot of duct length.

In rooms where air or temperature distribution is poor, the situation may be remedied by the use of "directional type" grilles, or by relocating air inlets, so that distribution covers the room, or so that a good flow of air is directed against the surfaces or heavy heat loss.

Where the air is not thrown far enough from an overhead supply, the condition may be remedied by restricting the inlet grille to increase the velocity, and simultaneously opening the volume damper so that the air volume will not be reduced by the increased resistance of the restricted grille.

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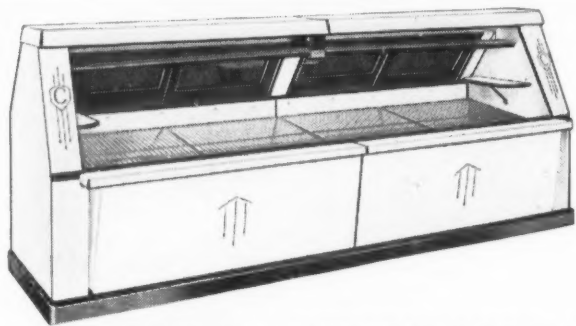
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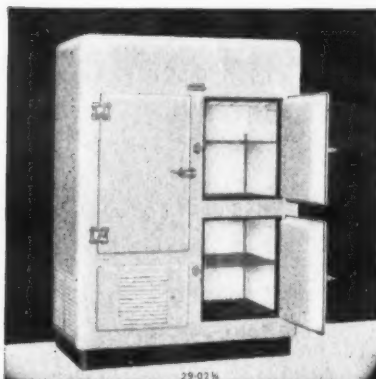
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Air Conditioning and Refrigeration News, 5229 Cass Ave., Detroit, Mich.



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TYLER Sales-Fixture COMPANY
Dept. E, NILES, MICHIGAN

SIX BIG NEW FEATURES

Methods of Correcting Improper Operation Of Heating Systems

(Concluded from Page 23, Column 3)
air supply is at the floor, it may be necessary to install recirculating grilles in the cold or dead areas in order to induce a circulation of air to such points.

Where the boiler or furnace capacity is insufficient, the surfaces may be sooted or limed, or the draft may be insufficient. The latter difficulty may be indicated by the use of a draft gauge, and may be remedied by removing restrictions from or cleaning the stack or breeching.

If firing is by stoker, the fuel feed may be insufficient, or the forced draft fan may be too small or operating too slowly.

If firing is by oil or gas burner, the orifice may be too small, so that insufficient fuel is supplied, or the secondary air adjustment may be wrong. In the case of the oil burner, too much air will produce a very white and noisy flame, while insufficient air will produce flames with smoky tips.

If the system does not heat, even after all corrective measures have been taken, it may be necessary to increase the system, or portions of it, or install storm windows, insulation, etc. This may be determined by computing the load, as described in Section 20.

Useful Factors

Air for Combustion: 1 cu. ft. per 25 to 30 B.t.u. liberated.

Combustion Chamber Volume: 1 cu. ft. per 35,000 to 50,000 B.t.u. liberated per hour.

Minimum Gas Temperature: For good combustion— $1,200^{\circ}\text{F}$. to $1,400^{\circ}\text{F}$.

Heat Transfer For Hand-fired Boiler: 3,500 to 5,000 B.t.u. per hour per sq. ft. average heating surface.

Heat Transfer for Mechanically-fired Boiler: 4,500 to 6,000 B.t.u. per hour per sq. ft. average heating surface.

Heat Transfer for Direct-fired Furnace: 1,500 to 2,500 B.t.u. per hour per sq. ft. average radiating surface.

Steam Liberating Surface: 1 sq. ft. per 50,000 to 100,000 B.t.u. per hour.

Heating Surface for Mechanically-fired Steel Boiler—E.D.R.—17.

Heating Surface for Hand-fired Steel Boiler—E.D.R.—14.

Heating Surface for Mechanically-fired Cast Iron Boiler—E.D.R.—12.

Heating Surface for Hand-fired Cast Iron Boiler—E.D.R.—10.

Furnace Volume—E.D.R.—140.

Grate Area (Up to 4,000 E.D.R. Capacity)—(E.D.R.—200)÷25.5.

Grate Area (Over 4,000 E.D.R. Capacity)—(E.D.R.—1,500)÷16.8.

Boiler hp.—33,479 B.t.u. per hour.

Boiler hp.—139 E.D.R. (Steam).

Boiler hp.—223 E.D.R. (Hot Water).

1 Steam E.D.R.—240 B.t.u. per hour.

1 Hot Water E.D.R.—150 B.t.u. per hour.

Clean Boiler with 1 lb. Sal soda per 10,000 B.t.u. per hour capacity.

Clean Boiler with 1 gal. white vinegar per 50,000 B.t.u. per hour capacity.

Coal Burned per hour (hand firing) 6 to 8 lbs. per sq. ft. of grate.

Coal Burned per hour (mechanical firing) 15 to 30 lbs. per sq. ft. of grate.

Air for Combustion—15 lbs. per 1 lb. of coal.

Coal Consumption Per Season: Cold Climate—.04 Tons per sq. ft. E.D.R.;

Medium Climate—.03 Tons per sq. ft. E.D.R.;

Mild Climate—.02 Tons per sq. ft. E.D.R.

Oil Consumption Per Season: Cold Climate—8 Gal. per sq. ft. E.D.R.;

Medium Climate—6 Gal. per sq. ft. E.D.R.;

Mild Climate—4 Gal. per sq. ft. E.D.R.

Thermal Value Average Oil: 19,000 B.t.u. per lb. or 140,000 B.t.u. per gallon.

Thermal Value Average Natural Gas: 1,000 B.t.u. per cu. ft.

Thermal Value Average Manufactured Gas: 500 B.t.u. per cu. ft.

Thermal Value Average Good Coal: 14,000 B.t.u. per lb.

Thermal Value Fair Coal: 12,000 B.t.u. per lb.

Thermal Value Poor Coal: 10,000 B.t.u. per lb.

Minneapolis-Honeywell Reports 1936 Profit of \$4.78 a Share

MINNEAPOLIS—Net income for 1936 of Minneapolis-Honeywell Regulator Co. was reported at \$3,082,360, equal to \$4.78 a share on 621,900 shares of common stock.

The company's net profit for 1935 was \$1,793,338, or \$8 a share on 207,300 common shares.

Direct Expansion System Employing CO₂ Conditions Detroit Furniture Store

BY F. O. JORDAN

DETROIT—Peoples Outfitting, one of the largest department stores in Michigan, is now 100% air conditioned by a system which is unique in several notable respects, for not only does it operate on direct expansion with carbon dioxide as the refrigerant, but the system is so installed that no usable space whatever is occupied by the equipment.

One of the factors which determined the management to invest their money in air conditioning was the surprising customer popularity of the first floor mezzanine as soon as it was air conditioned two years ago.

Before deciding upon the type of equipment and system to employ for conditioning their store, the management retained air-conditioning specialists to make a thorough investigation of available air-conditioning methods and equipment, and their adaptability to the peculiar conditions to be met.

LOADS NEARLY SAME

Frequently the indirect method of refrigeration is used in large projects of this type that involve many separate areas upon which the load periods are not the same, because the flexibility of the system which utilizes refrigerant-cooled brine or water, permits it to adjust itself readily to load conditions that do not vary simultaneously (for example, where both occupancy and sun effect loads may shift quickly from one location to another).

However, the location and arrangement of Peoples Outfitting, as well as the character of its occupancy, are such that the load periods upon all areas are approximately the same. For this reason it was deemed advisable to take advantage of the lower cost of direct expansion.

The types of equipment considered were room type conditioners using Freon as refrigerant, central system using Freon, and central system using carbon dioxide.

CENTRAL SYSTEM CHOSEN

The central system was selected over the unit conditioner because of the greater difficulty of installing the unit without using valuable space; because of the much more serious problems involved in introducing outside air for ventilation with the room unit in an existing building of this type; and because the central system could be arranged to utilize existing ventilating systems.

It is interesting to know that the "stiffness" noticeable in the second floor space which was conditioned by room units working on 100% recirculation of room air eventually was eliminated by removal of the room units and the conditioning of the second floor area by ducts extended from the central system through which a percentage of outside air is introduced.

The following considerations resulted in the selection of carbon dioxide:

The great height to which it is necessary to raise the liquid refrigerant (from sub-basement to roof of 13-story building) would necessitate the use of a refrigerant circulating pump if Freon were employed, because of the comparatively low head pressure customarily used with Freon.

However, the lift made necessary by this height would result in a very small percentage of addition to the high head pressures used with carbon dioxide.

It was thought that the heavy construction used in heavy duty slow speed carbon dioxide equipment should result in longer life with less maintenance for equipment of this large size. It is said that price was also in favor of carbon dioxide equipment.

The claim was made that these investigations brought out that carbon dioxide shows a higher horsepower per ton relationship than Freon if inlet condensing water never rises above 70°F .

CITY WATER USED

Another careful analysis was made in respect to the sources of condensing water. City water, with waste to the sewers, was selected because the prevailing rate in the quantities used by Peoples Outfitting showed a total (fixed plus operating) condensing water cost of \$1.45 per hour, against a total cost per hour for a cooling tower installation of \$3.87. No exact figures are now available on well water cost, although they are said to be between the above costs. Furthermore, no satisfactory site for a well could be agreed upon.

Based upon the above considerations, central system, direct expansion, carbon dioxide equipment was selected, with condensing water taken from the city mains as being best suited to this particular installation. Under many other conditions, and with other individuals acting as judges, obviously selections would be different.

TWO SYSTEMS USED

For the air conditioning of the building, two entirely separate systems are used, one for the basement, first floor, and first floor mezzanine areas, and the other for the second to thirteenth floors inclusive.

The basement, first floor, and first floor mezzanine were ventilated by a central system with a heating coil and fan of 24,000 c.f.m. capacity located in the sub-basement, and distributing through an existing duct system to the above.

To this system was added a filter bank, and a direct expansion coil (Concluded on Page 25, Column 1)

Air Supply Layout in Store Installation

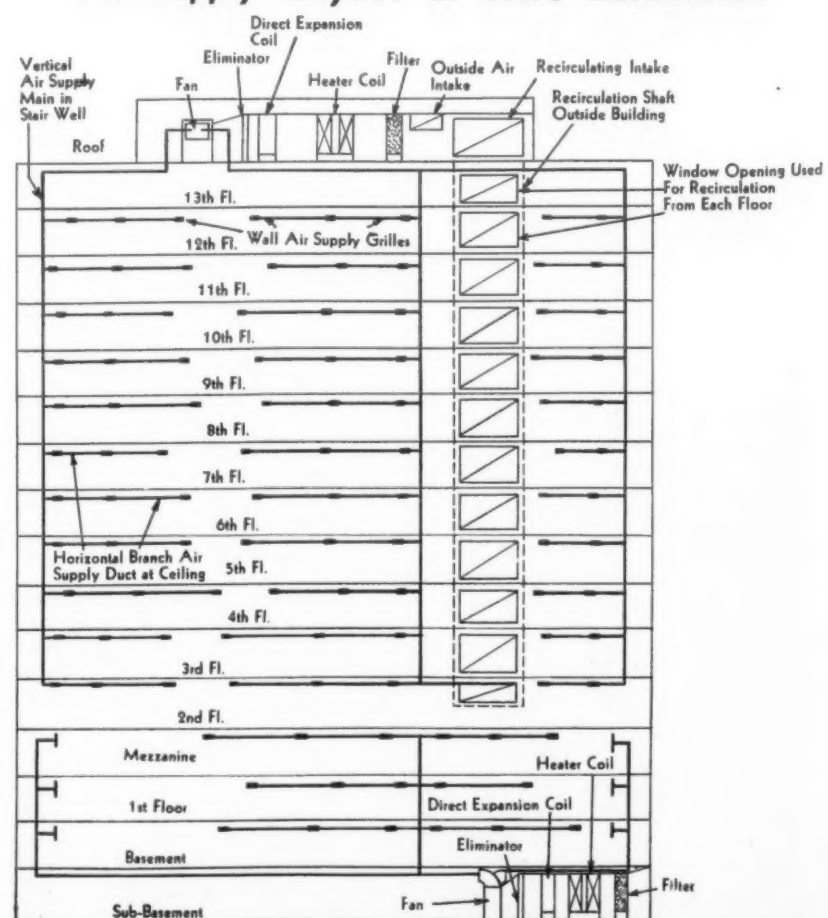


Fig. 1—Drawing showing layout of air distributing and recirculating system in the air-conditioning installation made in Peoples Outfitting Co.

Recirculating Shaft Outside Building Used in Large Detroit Installation

(Concluded from Page 24, Column 5)
served by a refrigerating unit which was located nearby.

So heavy is the first floor lighting load, that it is necessary to supply 50° air even in the winter to prevent the room dry bulb temperature from rising above 70°, even with no heating in operation. Since the system which conditions this space also serves other areas where heating is required, booster heaters are installed in ducts to such areas for the purpose of back-heating the air to prevent overcooling of them.

VENTILATION REVAMPED

The portion of the building which includes the third to thirteenth floors was ventilated by an existing system with outside air intake, heater coils and fan with 40,000 c.f.m. capacity in a roof penthouse, and a vertical air supply duct extending downward with horizontal ducts at the ceiling heights of the various stories.

This fan was replaced with a fan of 80,000 fan capacity, the existing heater coils were rearranged and increased to suit, and a direct expansion coil and filters were added. Additional vertical air-supply ducts were extended downward in unused spaces of stair wells, with horizontal branch ducts at the various ceiling levels as necessary for distributing the additional air quantity.

A recirculating shaft was constructed outside the building over the alley to recirculate air from the various stories through certain window openings and carry it upward to the penthouse. An outside air intake was provided, with suitable dampers for proportioning the outside and recirculated air to meet existing conditions.

MANUAL CONTROLS

The temperatures at the various floors are regulated by means of manual switches controlling modulating type dampers, one of which is located in the recirculating opening from each story to the main recirculating shaft. These control dampers were located in the recirculating openings rather than in the supply openings because there were so many supply openings that many more dampers would have been required.

The refrigerating equipment for this system is located in the sub-basement, with refrigerant piping extended upward within a shaft outside the building, so that the installation complies with the argument that no refrigerant lines should pass through the floors of a building.

ORDER OF HANDLING

The arrangement of air-handling and conditioning equipment is such that the air is drawn through the filter bank, the heater coils, the air-conditioning coils, entrained moisture-removing plates, and the fan, in the order named.

All air-supply ducts in unconditioned spaces are covered with cork and plaster, while those in conditioned spaces are merely furred. Supply grilles are located at the ceilings to discharge horizontally.

EQUIPMENT INSTALLED

Equipment used is as follows:

Compressors—Wittenmeier Ice Machine Co.'s carbon dioxide type with capacity-regulating clearance pockets, and two-speed synchronous motors. The unit for the lower areas is a 50-ton belt-driven unit, while the compressor for the upper portion of the building is a 175-ton duplex unit direct connected to a 200-hp. motor.

Motors—2-speed synchronous by American Electric Machinery Corp.

Condensers—Wittenmeier shell and tube type for 1200-lb. operating pressure.

Cooling coils—Wittenmeier fin and tube type for high-operating pressure.

Heating coils—Cast iron "Vento."

Filters—"Compact" filters (at 22½ f.p.m. air velocity) made by Independent Air Filter Co.

Fan—American Blower.

Pipe—Welded steel pipe for 1200-lb. pressure.

Expansion valves—Hand operated.

COST OF SYSTEM

The total cost of the entire installation is reported to have been about \$60,000, although the system would have cost approximately \$100,000 if it had not been possible to utilize certain existing equipment.

The system was designed and installed under the direction of H. E. Zeal, air-conditioning engineer for Albert Kahn, Inc., Detroit architectural and engineering concern of international repute. The installation was made by the American Refrigerating Co.

It is stated that during the later portion of the past summer after the system was placed in operation, satisfactory conditions were maintained with the compressors at low speed.

Editor's Note: Readers are invited to contribute further discussions regarding this interesting system.

Conditioning System Controls Humidity In Drug Plant

KALAMAZOO, Mich.—In its new chromium-trimmed, black and white marble, "streamlined" building, the Upjohn Co. here has installed air conditioning for maintaining conditions suitable for the manufacture of the pills, powders, and other drugs which they make.

Air conditioning is accomplished by Carrier "Weathermaker" unit conditioners which are located throughout the building as required. The rooms in which pills and powder are processed are sealed practically air-tight, as the accurate control of temperature, and especially humidity, is important in these locations.

Since the moisture content of these materials is so dependent upon the humidity of the surrounding atmosphere, and since their physical characteristics are so dependent upon their moisture content, it has been found impossible to work them properly if the room humidity is either too high or too low.

This is particularly true in the case of the making of tablets, as the product will not "tablet" at all if too moist, while if too dry, the tablets crumble after they are made.

For the coating of the tablets, rapid drying is very essential. Therefore a blast of hot, dry air is directed upon the newly coated tablet. Not only is this air heated, but it is put through a special dehumidifying process as well.

Another feature of this installation is the experimental unit built by Carrier, and resembling an ice box with accurately controlled refrigeration. The unit is used for testing out new products, and for testing out new uses of old ones.

Carrier Installs Hammerrill Office System at Night

ERIE, Pa.—All installation work on the air-conditioning installation made here recently in the executive offices of the Hammerrill Paper Co. was done at night so that there was no disturbance to the occupants.

Carrier equipment was installed by Scobell and Winston, local dealers for Carrier.

The installation was designed to blend smoothly with the restful early American home motif which is carried out in the natural wood walls, the huge wood-stocked fireplaces, and the heavy old-fashioned framed portraits and bookcases which are used to create "ye olde" Colonial atmosphere in this modern industrial institution.

Household Utilities Opens New Store in Kansas City

KANSAS CITY, Kan.—Household Utilities Co. opened a new store at 710 Minnesota Ave. here recently to deal in electric refrigerators and other household appliances. Emerson DeJarnett is manager.

The company, which maintains a similar store at 500 East 11th St. in Kansas City, Mo., was founded 12 years ago.

London Housing Expert Decries Bad U. S. Housing

NEW YORK CITY—Terming the United States "a land of great contrasts," Capt. Richard L. Reiss, member of the London County (England) Council's Housing Commission, said recently that at least one-fifth of the Middle West's population is badly housed.

Housing conditions in the United States are "definitely worse" than he expected, Capt. Reiss said. Spots he had seen in Boston, Pittsburgh, Des Moines, Buffalo, Youngstown, Chicago, and St. Louis were as bad as anything he had seen in Europe, he added.

American middle class housing, hotels, schools, art galleries, and modern office buildings, however, left Europe "miles behind," he conceded.

Thermal Properties of Various Types of Concrete Construction Discussed

BY F. O. JORDAN

ST. LOUIS—A discussion which brought out some new ideas on thermal properties of concrete construction was presented at the annual meeting of the American Society of Heating and Ventilating Engineers here by F. B. Rowley, director of experimental engineering laboratories, University of Minnesota, and Prof. A. B. Algren of the same institution.

Although at first thought there may seem to be no direct relationship between concrete and the air-conditioning industry, the words "thermal properties" should strike a note of interest because an important effect upon the air-conditioning load is indicated by these words, these educators believe.

There is no maker of air-conditioning equipment who is not aware of the problem of selling any considerable volume of small unit air-conditioning equipment until the selling

price of such a product is brought within the reach of the homeowner.

There is not much hope of great price reductions as long as a refrigerating capacity of several tons is needed to cool the average house. Since there is no known practical method of reducing the intensity of summer sunshine, the only way of reducing the load upon this class of air-conditioning equipment is to utilize building materials that have high resistance to heat flow.

In view of these points it appears that the use of materials in the construction of homes which tend to reduce the cooling load will benefit the air-conditioning industry because the resistance to air-conditioning sales will be lessened.

Insulating value of various arrangements of cinder block and Haydite block structures is tabulated in the accompanying table of thermal characteristics below.

Thermal Characteristics of Types of Concrete

Wall No.	Description of Wall	Outside Surface Treatment	Insulation In Core Spaces	Density of Insulation Lb./Cu. Ft.	Equivalent Thickness of Insulation Over Wall Surface	Overall Coeff. U for 15 Miles Wind Velocity	Overall Resistance 1/U
1a		As Laid	None			0.396	2.52
1b	8 in. x 8 in. x 16 in.	Painted	None			0.370	2.70
1c	3-Oval Core	Painted	Granulated Cork	5.12	3.15	0.201	4.97
1d	Cinder Block	Painted	Dry Cinders	69.70	3.15	0.283	3.53
1e		Painted	Rock Wool	14.21	3.15	0.211	4.74
2a	8 in. x 8 in. x 16 in.	As Laid	None			0.354	2.82
2b	3-Oval Core	Painted	None			0.354	2.82
2c	Haydite Block	Painted	Granulated Cork	5.06	3.15	0.172	5.81
3b	8 in. x 8 in. x 16 in.	As Laid	None			0.509	1.96
3c	3-Oval Core Sand and Gravel Block	As Laid	Granulated Cork	5.14	3.15	0.379	2.64
5a	8 in. x 12 in. x 16 in.	As Laid	None			0.374	2.67
5b	3-Oval Core	As Laid	Granulated Cork	5.24	4.81	0.199	5.03
15a	8 in. x 12 in. x 16 in.	As Laid	None			0.342	2.92
15b	3-Oval Core	As Laid	Granulated Cork	5.60	5.10	0.148	6.76

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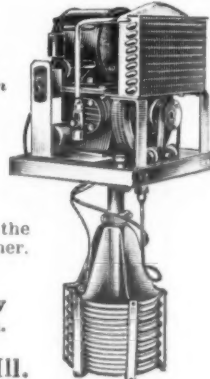
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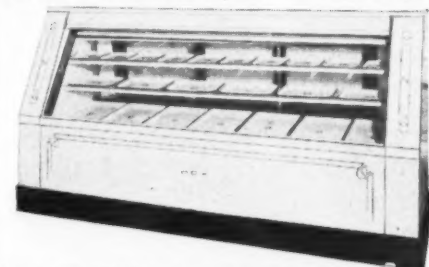
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POSITIONS AVAILABLE

EXCEPTIONAL OPPORTUNITY for four men as district sales representatives with nationally known coil manufacturer. Consideration will be given men with experience in contacting jobbers and distributors of electric refrigeration. We have openings for capable men who know the commercial business thoroughly. Must be able to sell, teach others how to sell, organize and manage territories. Applicants must be located in any of the following territories: Los Angeles, San Francisco, Seattle, Portland; and Kansas City, Missouri. Salary, expenses, and bonus. Full particulars regarding experience and references must be given in first letter. Strictly confidential. Write to M. W. KNIGHT, c/o PEERLESS OF AMERICA, INC., 515 W. 35th St., Chicago, Ill.

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SALES REPRESENTATIVE with complete knowledge of household and commercial equipment wholesale distribution, preferably with knowledge of application engineering, for Europe. State compensation expected and languages spoken. To be given consideration application must give full particulars regarding experience and references, which will be held confidential. Box 906, Air Conditioning and Refrigeration News.

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YOUNG MAN—31 years old—15 years' experience in electrical construction and maintenance work. Graduate of Utilities Engineering Institute of Refrigeration, Chicago. Have had some practical experience on refrigerators. Desire connections with firm in either capacity or combination of both. Have Michigan State Contractors and Journeyman's license for 1937. Box 904, Air Conditioning and Refrigeration News.

EXECUTIVE WITH ENGINEERING and sales experience available. Has traveled the East, South, and Middle West two years for a large refrigeration machinery manufacturer, had four years of engineering domestic and commercial refrigerators, and three years of air conditioning application work. Understands compressor design and problems of heating, cooling, and humidifying. Box 905, Air Conditioning and Refrigeration News.

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PATENTS

Issued Feb. 9, 1937

2,069,767. COMPRESSING APPARATUS. Alex A. McCormack, Dayton, assignor, by mesne assignments, to General Motors Corp. Application Dec. 23, 1932, Serial No. 648,705. Renewed March 20, 1936. 21 Claims. (Cl. 230-24)

2,069,772. REFRIGERATION. George C. Pearce, Dayton, assignor, by mesne assignments, to General Motors Corp. Appli-

cation Sept. 29, 1932, Serial No. 635,391. 21 Claims. (Cl. 62-4)

2,069,782. MEANS FOR DEFROSTING REFRIGERATORS. William Sluman, Montebello, Calif. Application Jan. 30, 1933, Serial No. 654,318. 4 Claims. (Cl. 62-4)

2,069,808. GAS REGULATOR. Sven W. E. Andersson, Evansville, Ind., assignor, by mesne assignments, to Servel, Inc., Dover, Del. Application June 14, 1934, Serial No. 730,585. 1 Claim. (Cl. 50-23)

2,069,816. AIR CONDITIONER. Lachlan W. Child, South Bend, Ind., assignor, by mesne assignments, to Air Devices Corp., Chicago. Application July 19, 1935, Serial No. 32,256. 16 Claims. (Cl. 257-244)

2,069,839. REFRIGERATION. Alvar Lenning, Stockholm, Sweden, assignor, by mesne assignments, to Servel, Inc., Dover, Del. Application Jan. 16, 1934, Serial No. 706,804. In Germany Jan. 31, 1933. 12 Claims. (Cl. 62-126)

2,069,840. REFRIGERATION. Alvar Lenning, Stockholm, Sweden, assignor, by mesne assignments, to Servel, Inc., Dover, Del. Application Nov. 12, 1934, Serial No. 752,616. 5 Claims. (Cl. 62-120.5)

2,069,865. REFRIGERATION. Hugo M. Ullstrand, Evansville, Ind., assignor, by mesne assignments, to Servel, Inc., Dover, Del. Application Oct. 25, 1934, Serial No. 749,871. 14 Claims. (Cl. 62-119.5)

2,070,057. AIR-CONDITIONING SYSTEM. Earle R. Mandie, Seattle, Wash. Application Nov. 11, 1933, Serial No. 697,643. 5 Claims. (Cl. 62-139)

2,070,097. ICE CUBE CRACKER. Lester E. Stipe, Portland, Ore. Application Sept. 16, 1935, Serial No. 40,737. 1 Claim. (Cl. 83-63)

2,070,379. AUTOMOTIVE REFRIGERATING AND COOLING SYSTEM. Nicola Stramaglia, Chicago. Application Oct. 28, 1936, Serial No. 107,941. 2 Claims. (Cl. 62-117)

2,070,398. BEVERAGE COOLING APPARATUS. Edward Freund, Long Beach, N. Y. Application Dec. 11, 1935, Serial No. 53,851. 12 Claims. (Cl. 62-148)

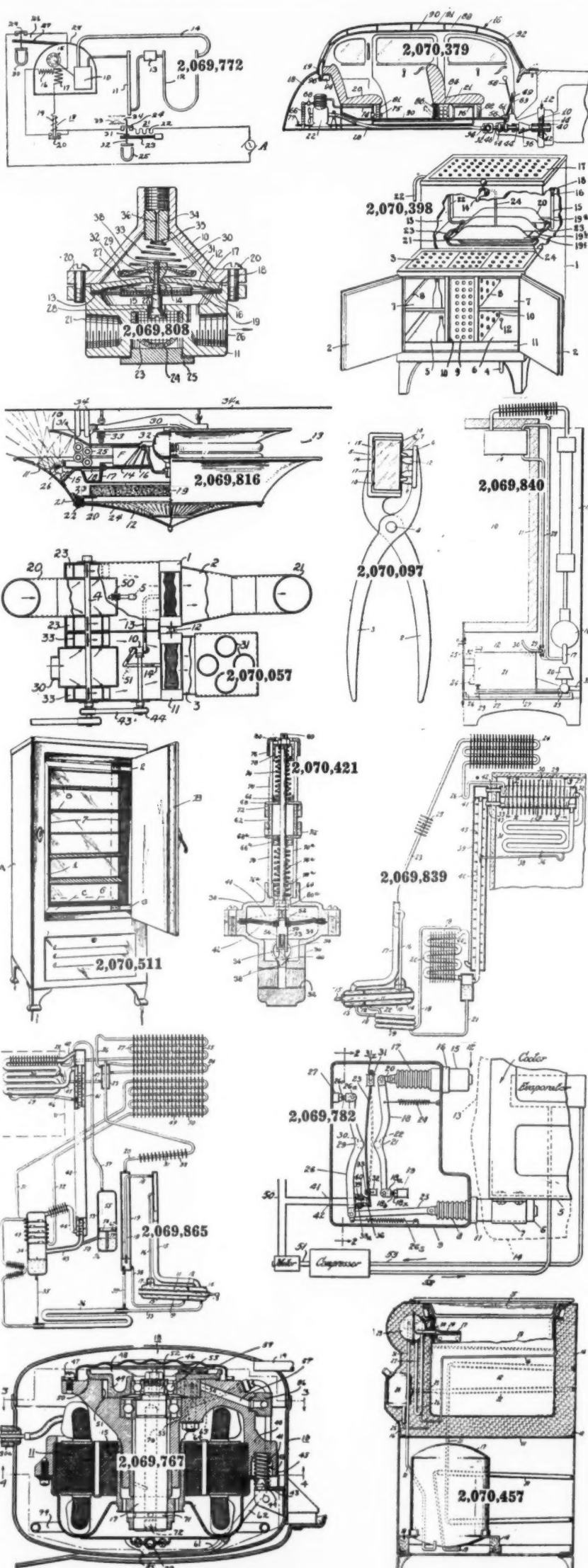
2,070,421. REFRIGERATING APPARATUS. Theodore L. Chisholm and David E. Maccabee, Dayton, assignors, by mesne assignments, to General Motors Corp. Application July 31, 1929, Serial No. 382,496. 10 Claims. (Cl. 137-153)

2,070,457. EVAPORATOR FOR REFRIGERATING MACHINES. Christian Steenstrup, Schenectady, assignor to General Electric Co. Application Dec. 6, 1934, Serial No. 756,244. 6 Claims. (Cl. 62-99)

2,070,511. DOMESTIC REFRIGERATOR. Everett G. Clements, Washington, D. C., assignor to Fairbanks, Morse & Co., Chicago. Application Aug. 1, 1934, Serial No. 737,992. 7 Claims. (Cl. 62-89)

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. VAN DEVENTER (ASRE), Patent Attorney, 342 Madison Avenue, New York City.



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"THE COILS BY WHICH OTHERS ARE JUDGED"

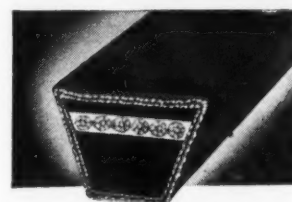
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BOX OVAL
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1. Top tension rubber.
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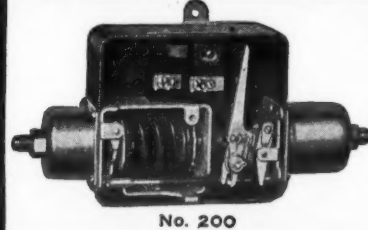
From 2 gals. per hour to 500 gals. per minute

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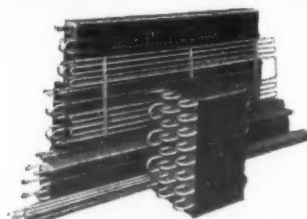
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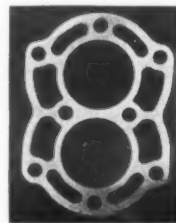
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the desirable
features of modern
fin coils.

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Chicago, Illinois



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offer you Metallic Gaskets that hold regardless of what your refrigerant may be and will not shed particles of material to clog up important working parts in a machine. A metal that will not "creep." Once tight it will stay "tight."

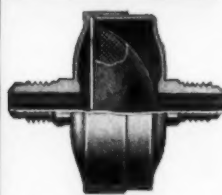
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HENRY



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62: Dryers, Strainers,
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Small Strainer

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Hemispherical screen has 70% more capacity than usual flat disc. Soldered brass shell. 120 mesh brass screen with No. 10 mesh brass screen reinforcement. Screen area, 4 sq. in. O. D. of shell 2 in. Weight 4 oz. \$2.60
List Price

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Stocked By Leading Jobbers

INFORMATION FOR SERVICE MEN

Where G-E Sealed Units Can Be Reconditioned

Dan H. Willis Co.
Main and Market Streets
Akron, Ohio

Editor:

We understand that there is a company in Chicago that reconditions G-E sealed units. Can you furnish us with their name and address.

D. H. WILLIS,
President.

Answer: American Refrigerating Engineering, Inc., 2257 Silvertown Drive, Chicago; and Refrigeration Maintenance Corp., 365 E. Illinois St., Chicago, advertise in AIR CONDITIONING AND REFRIGERATION NEWS that they repair General Electric hermetically sealed units.

Multiple Unit Installation For an Apartment

Chicago

Editor:

I wish to install a multiple refrigeration system to take care of six 3-room apartments.

In cost and satisfactory service, how does that kind of refrigeration system compare with regular electric refrigerators? Who sells the best system of that kind? What gas is best? Can I use common ice boxes?

All information you can give me on this subject will be appreciated.

PETER KEDAS

Answer: The tendency in recent years has been to get away from multiple refrigeration systems for apartment houses. Both from the standpoint of cost and convenience, it seems that individual units are being preferred. (See story on page 1 of the Oct. 7, 1936 issue of the News, under the heading "Savings of Self-Contained Units Over Multiple System Total \$2,561 on 96 Machines in One Year.")

For information on installation methods for multiple systems I would suggest you read the MASTER SERVICE MANUAL by K. M. Newcum, and also that you follow the COMMERCIAL REFRIGERATION MANUAL which is now appearing in serial form in AIR CONDITIONING AND REFRIGERATION NEWS. The installments in the last and in this issue should be of interest because they deal with the duplexing of flooded evaporators.

It is also important in installing multiple systems to follow the rules in your local city ordinance which have to do with the installation of multiple refrigeration systems.

Source of Supply for Carrene and Isobutane

Parsons Brothers
31-35 E. Washington Ave.
Bridgeport, Conn.

Editor:

Will you kindly advise us the names of manufacturers who can furnish Carrene and Isobutane.

S. B. BEARDSLEY

Answer: Write General Household Utilities Corp., 2638 N. Pulaski Rd., Chicago, Ill., and Carrier Engineering Corp., 850 Frelinghuysen Ave., Newark, N. J., about Carrene; and to the Matheson Co., East Rutherford, N. J., and Carbide and Carbon Chemicals Corp., 30 E. 42nd St., New York City, for information on Isobutane.

Address of Dickerson

The Merkel Brothers Co.
Burbank St. and C.L. & N.R.R.
Cincinnati

Editor:

Can you give us the address of Dickerson & Co., who we are told, are located in New Jersey and manufacture special types of commercial refrigeration evaporators?

HENRY W. MERKEL

Answer: Try The Dickerson Co., 148 Dickerson St., Newark, N. J.

BUGETKLOK A COIN METER AND A CLOCK

BUGETKLOK CO.
915 Washington St., Minneapolis, Minn.

**COMMONWEALTH
FITTINGS**

Built Right to Stay Tight

COMMONWEALTH
BRASS CORPORATION
DETROIT

Majestic Repairs

Dibble's Electric Shop
Sidney Center, N. Y.

Editor:

Please put me in touch with some concern who can repair Majestic top-mount condensing units, type 140.

O. B. DIBBLE

Answer: Refrigeration Products, Inc., 122 W. Illinois St., Chicago, Ill., and Peno Service Co., Fort Smith, Ark., advertise in REFRIGERATION NEWS that they service Majestic units.

Detailed service information on the Majestic Hermetic refrigerator was published in the August 16, 1933 issue of REFRIGERATION NEWS, and on the Majestic conventional refrigerator in the Sept. 12, 19, and 26, 1934 issues of the News.

Service information on both of these refrigerators is also contained in THE MASTER SERVICE MANUAL.

Motor Repair Equipment

12 Central Ave.
Wakefield, R. I.

Editor:

In your November 11 issue of the News, under Motor Repairs, it recommends the use of line reamers to ream bearings of fractional horsepower motors. I would like information as to where I can purchase these reamers, also literature and prices.

H. F. DONOHUE

Answer: Write to George Tatem, Electric Refrigeration Motor Co., Inc., 1825 Wylie St., Philadelphia, Pa., author of the article, for information on these machines.

Source of Supply on Activated Alumina

Rocke International Electric Corp.
100 Varick St.
New York City

Editor:

We want to contact manufacturers' suppliers of Activated Alumina, the drying agent for dehydrators, this required for export.

W. H. KNAPP, Export Dept.
Answer: Write to Aluminum Co. of America, Gulf Building, Pittsburgh, Pa., to find out your nearest source of supply for Activated Alumina.

Hasco Changeovers

Mechanical Refrigeration Service Co.
1922 Nineteenth St.
Portsmouth, Ohio

Editor:

We have searched the buyer's guide over, yet cannot find what we are looking for yet we know it is being made. What we wish to find is a company, we believe is in Carolina or Florida, which makes a conversion outfit to change over water cooled compressors to air cooled. We have a number of model N & C Frigidaire water-cooled compressors which we would like to change over to air cooled, so we would appreciate this information very much.

E. L. MINCH

Answer: We believe you refer to the Home Appliance Service Co. (Hasco), Greensboro, N. C., of which W. H. Parker is manager.

Status of New York Code

1900 Bergen St.
Brooklyn, N. Y.

Editor:

Recently, you printed items about the proposed New York City refrigeration code and the licensing of service men. Will you please inform me of what has been definitely decided

about it? Any information would be greatly appreciated.

HAROLD SCHNITZER

Answer: The New York City refrigeration code has not yet been passed. For any further information regarding this code, write to C. K. Michaels, Bureau of Combustibles, Municipal Bldg., New York City.

Articles on New York Code

Trenton Auto Radiator Works
Trenton, N. J.

Editor:

Will you kindly send us collect a copy of the issue of AIR CONDITIONING AND REFRIGERATION NEWS, which contained the proposed refrigeration code for New York City.

DAN COHEN

Answer: The code as revised to December, 1935, was published complete in the Nov. 13, 1935 issue of the News. Changes made in the code at subsequent hearings were published in the March 25, and April 8, 1936 issues.

For a complete copy of the code as it now stands, contact C. K. Michaels of the Bureau of Combustibles, Municipal Bldg., N.Y.C.

Flexible Metal Coverings For Refrigerant Lines

Leo S. Bosarge Co.
315 Spring St., N.W.
Atlanta, Ga.

Editor:

We would appreciate it if you would furnish us the name and address of companies who make flexible metal tubes that are used for covering refrigerant lines.

LEO S. BOSARGE

Answer: Manufacturers of flexible metal tubes for refrigerant lines are as follows:

Apollo Metals, Inc.
La Salle, Ill.
Chicago Metal Hose Corp.
Maywood, Ill.

Moisture in Methyl Systems

The Brunswick-Balke-Collender Co.
623-633 South Wabash Ave.
Chicago, Ill.

Editor:

Won't you please send me three copies of the News which has Dan Wile's article on moisture in methyl chloride and other types of refrigerating systems.

R. H. GUYTON,
Refrigeration Engineer.

Answer: This article was published in the Nov. 4, 1936 issue of the News.

Pinch-Off Clamp for Refrigerant Tubing

Hoy & Co., Inc.
39-41 Columbia St.
Albany, N. Y.

Editor:

We would appreciate it if you would advise us the names of the companies that manufacture a pinch off protector clamp. This clamp is used to keep the tubing rigid after it has been reopened.

R. WRIGLEY

Answer: The following companies either can supply you with such clamps or tell you where you can get them:

American Injector Co.
1481 14th St., Detroit, Mich.
Henry Valve Co.
1001 N. Spaulding Ave., Chicago, Ill.
Holsclaw Bros., Inc.
317 Goodsell St., Evansville, Ind.
Imperial Brass Mfg. Co.
564 S. Racine Ave., Chicago, Ill.
Mueller Brass Co.
Port Huron, Mich.
Riley Engineering Corp.
1481 Fourteenth St., Detroit, Mich.
Weatherhead Co.
632 Frankfort Ave., Cleveland Ohio

REFRIGERATION SUPPLY JOBBER ACTIVITIES

Display Cartoons Used in Jobber's Promotion

SAN FRANCISCO—Strange facts uncovered by Robert L. Ripley form the basis of a new series of promotion pieces being issued by California Refrigerator Co., local jobber of refrigeration and air-conditioning equipment, parts, and supplies.

The company plans to distribute a different "Believe It or Not" folder each month, in the hope that "besides entertaining you, it reminds you now and then of our eagerness to serve you." The folders also mention, of course, the various advantages of dealing with California Refrigerator Co.

Name of the person to whom the folder is sent is imprinted on the cover of each piece.

GENERAL ELECTRIC

A COMPLETE GENERAL ELECTRIC REFRIGERATOR REPAIR SERVICE

Servicing and rebuilding of General Electric Refrigerators with AREINC replacement parts carefully machined to exact precision. Our rebuilding includes the electric cycle along with the mechanical overhaul and refinishing of exterior unit. This service also covers any make of Hermetically sealed units such as Westinghouse, Majestic, etc.

American Refrigerating Engineers, Inc. 2257 Silvertown Drive, Chicago, Ill.

New Alter Catalog Features Retail Service Catalog

CHICAGO—A retail refrigeration service catalog, listing only retail prices and designed for distribution by independent service firms to their customers, is a featured item in the latest catalog issued by Harry Alter Co., refrigeration supply distributor.

Several pages in this "Expert Refrigeration Service" catalog are devoted to suggestions and recommendations intended to interest customers of service companies.

The Alter name appears nowhere in this service catalog. Instead, adequate space is left on the cover for the imprint of the dealer's name.

In addition to information on the new service catalog, the Alter catalog contains completely revised product and price lists.

BUYER'S GUIDE

SPECIAL RATES APPLY TO THESE COLUMNS ONLY
WRITE ADVERTISING DEPT. FOR FULL INFORMATION

BRAZED IN CONTROLLED ATMOSPHERE

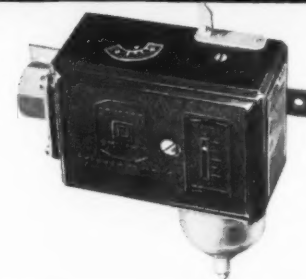
This receiver tank is made with special stampings brazed in a controlled atmosphere electric furnace. This process is the newest of our facilities for producing Pressed Metal Products. We furnish stampings, assemblies, hydrogen brazing and enameling. Stamped compressor bases are one of the many items we supply. Check us for prices.



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Class 9100 REGULATOR with MANUAL CUT-IN LEVER



Allows starting of refrigerating cycle in advance of normal cut-in point . . . does not affect operation of high pressure cut-out or overload . . . can be applied to any 9100 Regulator, temperature or pressure.

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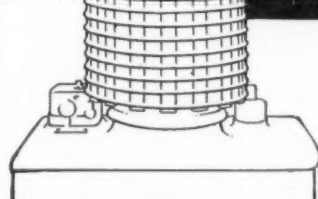
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A complete rebuilding and replacement service. All units tested for temperature, cycling, wattage consumption and quietness. Thousands of units rebuilt in past seven years. We guarantee satisfaction.

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Air cooled

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suitable for units up to 1/4 H. P.

to 1/4 H. P.

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